LEAD WEEK - October 4-8, 1982

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March 3, 1983

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To: Local Board of Health

Subject: LEAD WEEK - October 4 - 8, 1982

Origin: Local Board of Health, August 4, 1981 (c34h1th83022:156)

Comments:

At its meeting on August 4, 1981, the Local Board of Health approved of a Lead Week being held in the Eastern Health Area in October 1982. The attached report on the Lead Week is divided into three parts:

PART I South Riverdale Community Blood Lead Screening, 1982;

PART II A study of area specific blood lead levels in Toronto Grade 1 children;

PART III Conclusions and Recommendations developed by the Eastern Health Area staff, after consultation with the Environmental Health Committee of South Riverdale Community Health Centre and representatives of the Ministry of the Environment.

RECOMMENDATIONS:

1. That the Local Board of Health receive PART I and PART II of this report for information.

2. That the Local Board of Health endorse PART III of this report.

A.S. Macpherson, M.D., M.Sc.
Medical Officer of Health.

EE:lm
Attach.

PART I

SOUTH RIVERDALE COMMUNITY BLOOD LEAD SCREENING 1982

conducted by

EASTERN HEALTH AREA

Department of Public Health, City of Toronto

in cooperation with

Environmental Health Committee

of

SOUTH RIVERDALE COMMUNITY HEALTH CENTRE

INTRODUCTION AND BACKGROUND INFORMATION

In the late 1960's and early 1970's lead contamination of the environment first became a public concern in Ontario.[1] Results from studies of the soil and vegetation around suspected lead sources in 1972 and 1973 revealed that the degree of lead contamination of soil and vegetation in the vicinity of the Canada Metal Company Ltd. (CMC) on Eastern Avenue was the highest in the province.[2]

Surveys and screening clinics began with University of Toronto's Environmental Studies in May, 1973. Subsequently, a Working Group, established by the Ministry of the Environment (MOE) in October 1973, and the Toronto Department of Public Health have reported several studies through October, 1981, (Table 1).

The Working Group on Lead with representation from MOE, the Ministry of Health, the Ministry of the Attorney General and the Toronto Medical Officer of Health was to look into the lead situation around three lead processing plants in Toronto and two in Mississauga. In March 1974, the Robertson Committee was set up by the Ministry of Health to report on the health aspects of lead.

In November 1974, because of the general concern about lead contamination, the Environmental Hearing Board was directed by Order in Council to hold public hearings on the reports of these two committees. Evidence showed that cases of lead poisoning and high blood lead levels of people living near the Toronto lead plants was related to contamination of the air, soil and vegetation from lead processing. Five Toronto children with high blood lead levels were treated at the Hospital for Sick Children with chelation therapy in 1973-74. The Institute of Environmental Studies (University of Toronto) concluded that 13% of 1041 children living close to CMC had blood lead levels in excess of 40 ug/dl.[3]

Recommendations of the two committees and the Hearing Board dealt with numerous issues including mandatory approval for lead plants, the management of lead waste and control of emissions, monitoring of air and soil near possible sources of lead, remedial work and abatement, industrial zoning away from residences, the reduction of exposure of workmen to lead, regular blood lead surveillance

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TABLE 1

LEAD SURVEYS IN SOUTH RIVERDALE AREA OF TORONTO SURROUNDING THE CANADA METAL COMPANY LTD.

INVESTIGATOR	TIME	PERSONS SURVEYED	AGES	MEAN BLOOD LEAD (ug/dl)	% ≥ 30 ug/dl	% ≥ 40 ug/dl
ENVIR. STUDIES UNIV. OF TORONTO	May-Dec. 1973	1041 (CMC) 1425 (City-wide)	Children	28 arith. mean		13
MOE WORKING GROUP	Oct. 1973 Jan. 1974	1633	All 0-3 0-8			13 6.5
DPH (City of Toronto Dept. of Public Health)	Summer of 1974	2302 (City-wide) 478 708	All 0-4 5-9		15 20 16	
DPH	Aug. 1976	222 32 39	 0-4 5-9		3.5 10 2.5	
DPH	June 1977	74 12 20	 0-4 5-9	14.6 geom. mean	10 8 5	
DPH	Oct. 1980	112 25 25	 0-4 5-9	9.1 geom. mean	0 0 0	
DPH	Oct. 1981	341 24 213	 0-3 4-9		< 1 < 1	

for employees and lowering the accepted blood lead level in industry from 80 ug/dl, ongoing surveys of blood lead levels in communities around possible sources, reduction of automobile emissions, and education about lead hazards.

Lead abatement programs were instituted. The Ministry of the Environment in conjunction with the City of Toronto and CMC undertook to replace the soil on 37 properties in the vicinity of the plant, which were found to contain lead greater than 3,000 p.p.m.(2) This was paid for by Wintario.

Because the issue of lead in Riverdale had not been completely and satisfactorily dealt with by the control measures described above (e.g. all the contaminated soil was not removed, emissions from CMC sometimes exceeded the limits due to breakdown of control equipment), the Environmental Health Committee (EHC) of South Riverdale Community Health Centre (SRCHC) was formed in 1979.(4)

The Local Board of Health, on August 4, 1981, considered the following:

1) "Health Effects of Low Lead Level Exposure with Special Reference to Certain Areas of Toronto", a report prepared by Drs. G.J. Stopps, J. Pauker and V. Alcock, Faculty of Medicine, University of Toronto. Dr. Stopps attended and commented on the report.(5)
2) A report, dated July 22, 1981, as requested from the Medical Officer of Health regarding the Response to Dr. Stopps' Report Part III prepared by the Eastern Health Area Managers with recommendations and cost estimates for Lead Week.
3) A report dated January 19, 1981, as requested from the Medical Officer of Health on Points Raised in the Brief from South Riverdale Lead Liaison Committee at the Board meeting December 10, 1980.
4) A report dated November 14, 1980, as requested from the Medical Officer of Health regarding Consulting Study, Neurological Testing of School Children as a Screening Method in the Detection of the Health Effects of Lead Exposure.
5) A communication from Mr. David Pinkus, Vice-Chairman, Local Board of Health, October 31, 1979 regarding recommendations pertaining to lead.

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6) Deputations by representatives from
   a) EHC of SRCHC
   b) Eastern Health Area Community Advisory Board (CAB)

The Board decided

1) To approve of a Lead Week being held in either the last week of September or the first week of October, 1982 with the EHC and CAB being involved in the planning thereof;
2) To endorse the operation of a blood lead screening clinic in late September or early October 1982 at Bruce School with the above groups having input;
3) To defer consideration of the Stopps report until it has an adequate assessment from the staff of the Department of Public Health on the points raised in the report and also on the concerns of EHC.(6)

A Composite Report on Matters Relating to Lead and Lead Programs in the City of Toronto including an interim report on Lead Week was received by the Local Board of Health on September 14, 1982.(7)

Objectives of Lead Week

1) To increase the awareness of people in the community about the sources and effects of lead pollution in the environment; to give information about methods which people can take to lower their exposure to lead.
2) To ensure good community response in attending the lead clinics so that a mass of lead data specific to South Riverdale will be available.

Objectives of Community Mass Lead Screening

The Stopps report defined the following objectives:(5)

1) "To establish, at a particular time, the blood lead levels of children aged ten and under, and of women aged fifteen to thirty-five (inclusive), living within 1,500 metres of the centroid of the Canada Metal Co. plant on Eastern Avenue.
2) To examine the data developed under the first objective and to set out the blood lead levels by age group, sex and place of residence.

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3) To evaluate the results in the light of
   a) what is presently known about the possible effects of low level lead exposure in humans, and
   b) the possibility of carrying out further studies in Toronto which might help in assessing any health effects of the lead body burden of the residents."

The Department of Public Health identified additional objectives:

4) That "a decision will be made by the community, the Department and the Board (of Health) as to whether or not lead screening should continue in the City of Toronto; the best method of screening, etc.".(8)
5) To test the hypothesis that South Riverdale blood lead levels are significantly higher than elsewhere in Toronto.

METHODS

The target area was defined as that within 1,500 metres of CMC. The target age groups were defined as children aged 0 - 9 and females of reproductive ages, 15 - 44.

On January 11, 1982 the Eastern Health Area (EHA) Management Team met with EHC for initial discussion about Lead Week. It was decided that EHA should operate the clinics and that EHC should be responsible to ensure that the community was well informed about the problems with lead and that attendance at the clinics would be good. A Lead Week Planning Committee was struck with EHA and community representation. The community Lead Week Coordinator was hired by SRCHC through a Purchase of Service by the City.

In addition to testing at Bruce School, it was decided to hold clinics at other sites in order to be more easily accessible to the community. Four local schools were selected for screening clinics and the dates set: Bruce on October 4; St. Joseph on October 5; Leslie on October 6 and Morse on October 7. Permission for the use of their facilities and cooperation of their staff was kindly granted by the Toronto Board of Education and the Metropolitan Separate School Board.

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Promotional material was prepared and printed by the City and distributed as follows:

1) A community letter from the Medical Officer of Health (Appendix 1) and information leaflet (Appendix 2) were delivered in late September 1982 to all households within approximately 1,000 metres of CMC to encourage attendance at the clinics.
2) Posters were placed in libraries, stores, clinics and other public places throughout the community.
3) School flyers (Appendix 3) in three languages and consent forms (Appendix 4) were sent home by school nurses to be signed and returned if the parents/ guardians agreed to have their child tested with a finger prick blood test.
4) A pamphlet "Get the Lead Out" (Appendix 5) was printed by the Department of Public Health. This educational material was developed by SRCHC in consultation with the Ontario Ministry of the Environment and the Information and Community Services of the City of Toronto. Each person tested received one of these pamphlets with their results.
5) Lead Week balloons were given to children tested in the clinics.

Two training sessions for Departmental staff in July and August included a lecture on the historical background of Lead Week, sources of lead, its effects in high and low levels, summary of data from previous screening surveys, and training in clinic duties.

Community volunteers were organized by the SRCHC Lead Week Coordinator for client traffic control, blowing up balloons, hand washing and giving out information.

During screening sessions, EHA public health nurses and physicians took duplicate capillary blood specimens, assisted by other nurses or inspectors. Clerical staff registered the patients and labelled the specimens which were then packed and forwarded the following morning by air to the Environmental Sciences Associates (ESA) Laboratories, Inc. in Boston.

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The results were received approximately two weeks later. Individual letters stating the test results (Appendix 6) were prepared and mailed together with the pamphlet "Get the Lead Out" to help each person understand the problem.

Catch-up clinics were held on November 22 at 815 Danforth, November 24 at St. Joseph's School, and November 25 at Bruce School to re-test 65 clients whose specimens were broken, leaking or clotted and therefore unsuitable for lab analysis, (Appendix 7). The clinics also tested clients unable to be tested in October due to shortage of supplies. Additional catch-up clinics for school children who still were to be tested were arranged during school hours in their own schools and their parents were informed by a letter sent home from school with the child (Appendix 8).

If the average of the duplicate blood lead screening test results was 30 ug/dl or over, the letter about the results was delivered by a public health nurse. During her home visit, she completed an epidemiological form and a questionnaire identifying possible sources of lead contamination in the home environment. (Appendix 9). Clients were referred to the Hospital for Sick Children Medical Clinic for confirmatory tests. In a few cases, they preferred to consult their own doctors.

Reports on the confirmatory testing were followed up by the public health nurses. If further tests confirmed that the blood lead level was 30 ug/dl or over, or the free erythrocyte protoporphyrin (FEP) level was 50 ug/dl or over, a referral was made either to his/her personal doctor or back to the Hospital for Sick Children for further medical evaluation and treatment if indicated.

A public health inspector also visited the homes of any confirmed cases to check out with their greater expertise any possible environmental sources of lead, according to Departmental procedure.

The Ministry of the Environment conducted soil sampling at the school sites during the fall. In addition, they were requested to test the soil near the homes of patients who had screening blood lead tests of 30 ug/dl or over.

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The screening lead results were displayed graphically on a large map of the area within 1,500 metres of CMC. Pins, colour coded for various blood lead levels, were placed to show the distribution of lead levels by smaller sections of the area.

Screening results were computer analyzed by age group, sex, month/site of testing, and residence using a general linear models procedure.

RESULTS

Response Rate

Attendance at the clinics exceeded the expected 2,000 with 2,260 being tested in EHA.

TABLE 2

SCREENING CLINIC ATTENDANCE BY VARIOUS FACTORS

		Number	% of Total
Month	October, during Lead Week	- 2,159	95.5
	November, at catch-up clinics	- 101	4.5
Sex	Males	- 1,009	44.7
	Females	- 1,250	55.3
	Not recorded	- 1	
Test Site	Bruce School	- 337	14.9
	St. Joseph's School	- 628	27.8
	Leslie School	- 631	27.9
	Morse School	- 511	22.6
	Other EHA sites (Grade 1's in 6 other schools and 815 Danforth)	- 153	6.8
Area of Residence	Residences were classified in four areas:		
	EHA 0 - 500 (metres from CMC)	- 493	21.8
	EHA 500 - 1000 (metres from CMC)	- 933	41.3
	EHA 1000 - 1500 (metres from CMC)	- 429	19.0
	EHA 1500 + (beyond 1500 metres from CMC)	- 404	17.9
	Not recorded	- 1	

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Using preliminary Canada census data 1981 as a basis for the estimated population of the target area, a comparison is made with the tested population residing in that area (Table 3 and Figure 1).

TABLE 3

COMPARISON OF TARGET AREA POPULATION AND INDIVIDUALS TESTED

AGE	TARGET AREA	INDIVIDUALS TESTED	PERCENTAGE OF TARGET
Target Group			
0 - 4	1,843	295	16.0
5 - 9	1,975	716	36.3
Females 15 - 44	6,964	276	4.0
Total Target Group	10,782	1,287	11.9
Others			
10 - 14	2,282	340	14.9
15 +	16,977	228	1.3
Total	30,041	1,855	6.2

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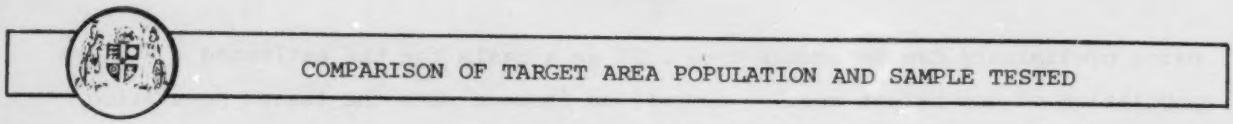
FIGURE 1


COMPARISON OF TARGET AREA POPULATION AND SAMPLE TESTED
MALES
AGE
FEMALES
70 +
65 - 69
60 - 64
55 - 59
50 - 54
45 - 49
40 - 44
35 - 39
30 - 34
25 - 29
20 - 24
15 - 19
10 - 14
5 - 9
0 - 4
5 4 3 2 1 0
0 1 2 3 4 5
PERCENT OF TARGET AREA POPULATION
LEGEND
Sample Tested
Living Within Target Area

Screened Blood Lead Levels

The mean blood lead level was 12.1 ± 5.1 ug/dl.

1) Sex

Male levels were significantly higher than female levels (Table 4 and Figure 2).

Male - 13.1 ± 5.1 ug/dl
Female - 11.2 ± 4.4 ug/dl
} p 0.0001

TABLE 4

PERCENTAGE DISTRIBUTION OF BLOOD LEAD BY SEX

	Blood Lead (ug/dl)								Number Tested
	00-4.9	05-9.9	10-14.9	15-19.9	20-24.9	25-29.9	30-34.9	35 +	
Male	1.5	24.0	42.1	23.5	6.2	2.0	0.3	0.4	1,009
Female	4.1	36.2	40.3	15.9	2.6	0.6	0.2	0.2	1,250
Number Tested	66	694	929	436	96	28	5	5	2,259
Data Incomplete - 1									2,260

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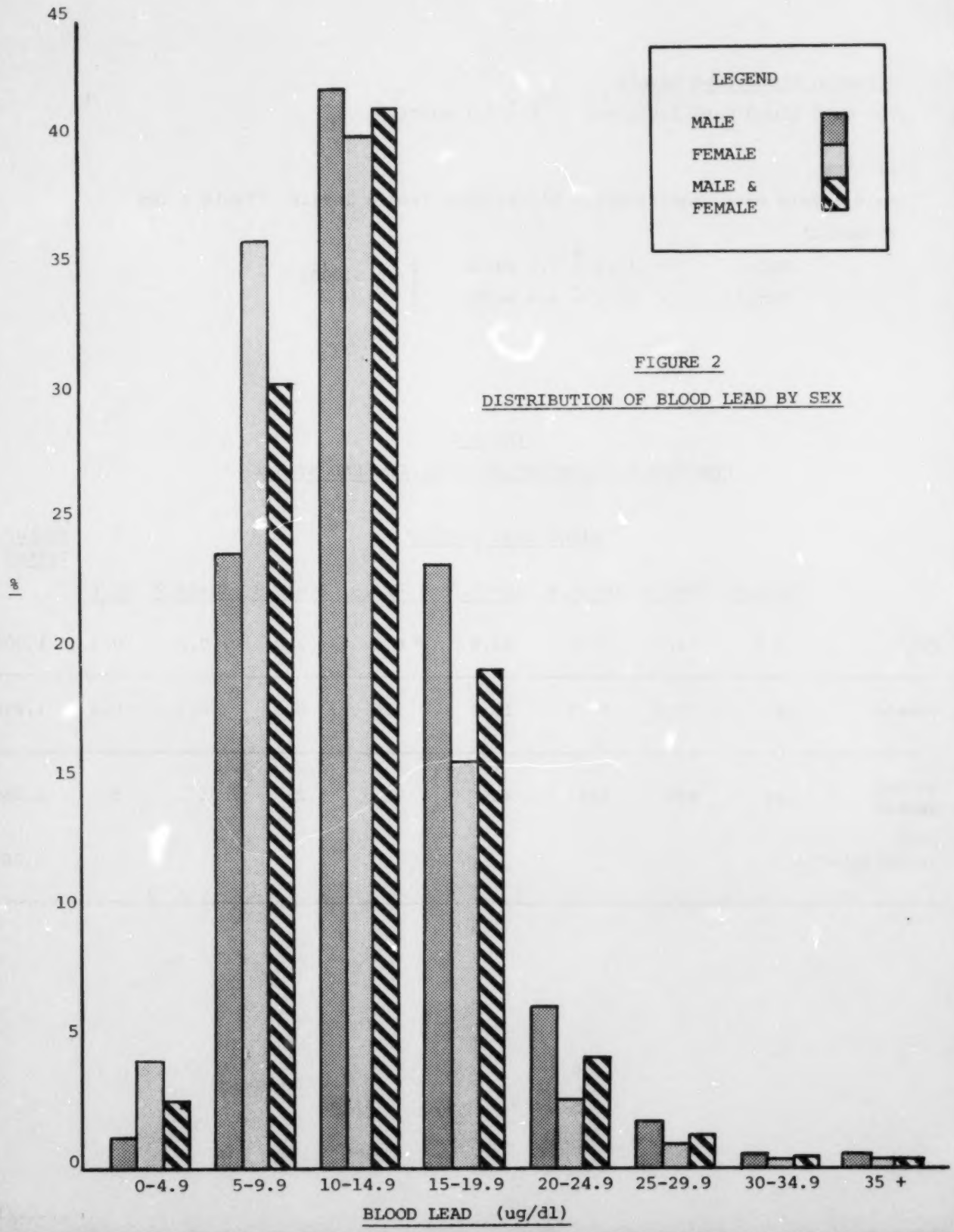

FIGURE 2

DISTRIBUTION OF BLOOD LEAD BY SEX

2) Age

Screened blood lead levels by age are shown on Table 5 and by target age groups on Figure 3.

TABLE 5

PERCENTAGE DISTRIBUTION OF BLOOD LEAD BY AGE

	Blood Lead (ug/dl)								
Years	00-4.9	05-9.9	10-14.9	15-19.9	20-24.9	25-29.9	30-34.9	35 +	Number Tested
0 - 4	1.5	19.8	39.5	27.4	8.8	2.1	0.3	0.6	329
5 - 9	2.5	31.1	43.0	19.5	3.1	0.7	0.1	0.0	881
10 - 14	3.0	33.7	42.9	15.5	3.5	0.8	0.5	0.2	401
15 - 19	3.7	33.3	48.2	14.8	0.0	0.0	0.0	0.0	27
20 - 24	0.0	42.0	40.0	18.0	0.0	0.0	0.0	0.0	50
25 - 29	9.6	41.7	35.7	6.1	6.1	0.0	0.0	0.9	115
30 - 34	2.7	39.6	36.9	16.1	3.4	1.3	0.0	0.0	149
35 - 39	5.2	27.1	42.7	14.6	6.3	4.2	0.0	0.0	96
40 - 44	1.9	35.9	39.6	20.7	1.9	0.0	0.0	0.0	53
45 +	3.3	22.9	36.6	27.5	4.6	3.9	0.6	0.6	153
0 - 45 +	2.9	30.7	41.2	19.3	4.3	1.2	0.2	0.2	2254
Number Tested	66	691	929	435	96	28	5	5	2254
Data Incomplete - 6									2260

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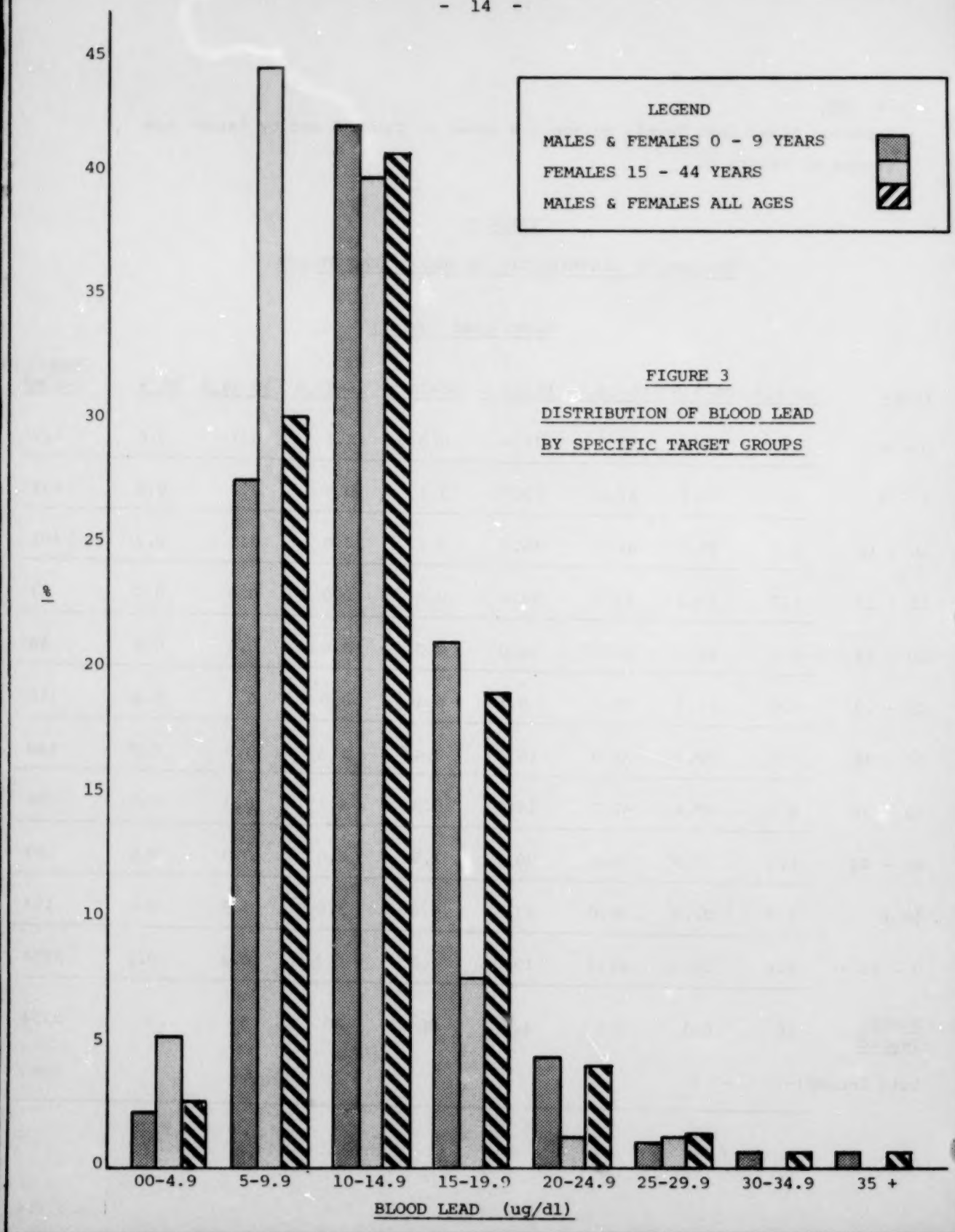

FIGURE 3

DISTRIBUTION OF BLOOD LEAD

BY SPECIFIC TARGET GROUPS

Children aged 0 - 5 years had significantly higher lead levels (p 0.0001) than those 6 - 9 years, after correcting for sex and area of residence (Figure 4 and Table 6).

3) Testing Site

Blood lead values by testing site are shown in Table 7.

TABLE 7

PERCENTAGE DISTRIBUTION OF BLOOD LEAD BY TESTING SITE

Blood Lead (ug/dl)

Site	00-4.9	05-9.9	10-14.9	15-19.9	20-24.9	25-29.9	30-34.9	35 +	Number Tested
Bruce	2.7	31.2	39.9	18.1	7.1	0.9	0.0	0.0	337
St. Joseph	3.5	31.9	43.6	16.1	3.2	1.3	0.2	0.3	628
Leslie	2.7	33.8	37.9	20.6	4.0	0.8	0.3	0.0	631
Morse	2.2	24.1	42.3	24.5	4.9	1.8	0.2	0.2	511
Other	4.6	34.6	43.8	12.4	1.3	2.0	0.7	0.7	153
Number Tested	66	694	930	436	96	28	5	5	2260

4) Testing Time

The mean lead levels for children tested in October (12.2 ug/dl) and November (12.8 ug/dl) were not significantly different. Two children tested in December had values under 10 ug/dl.

5) Area of Residence

EHA 500 - 1000 was insignificantly higher than EHA 0 - 500, and significantly higher than EHA 1000 - 1500. EHA 1500 + was significantly lower than all other areas (Figure 5).

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FIGURE 4

MEAN BLOOD LEAD BY AGE ≤9

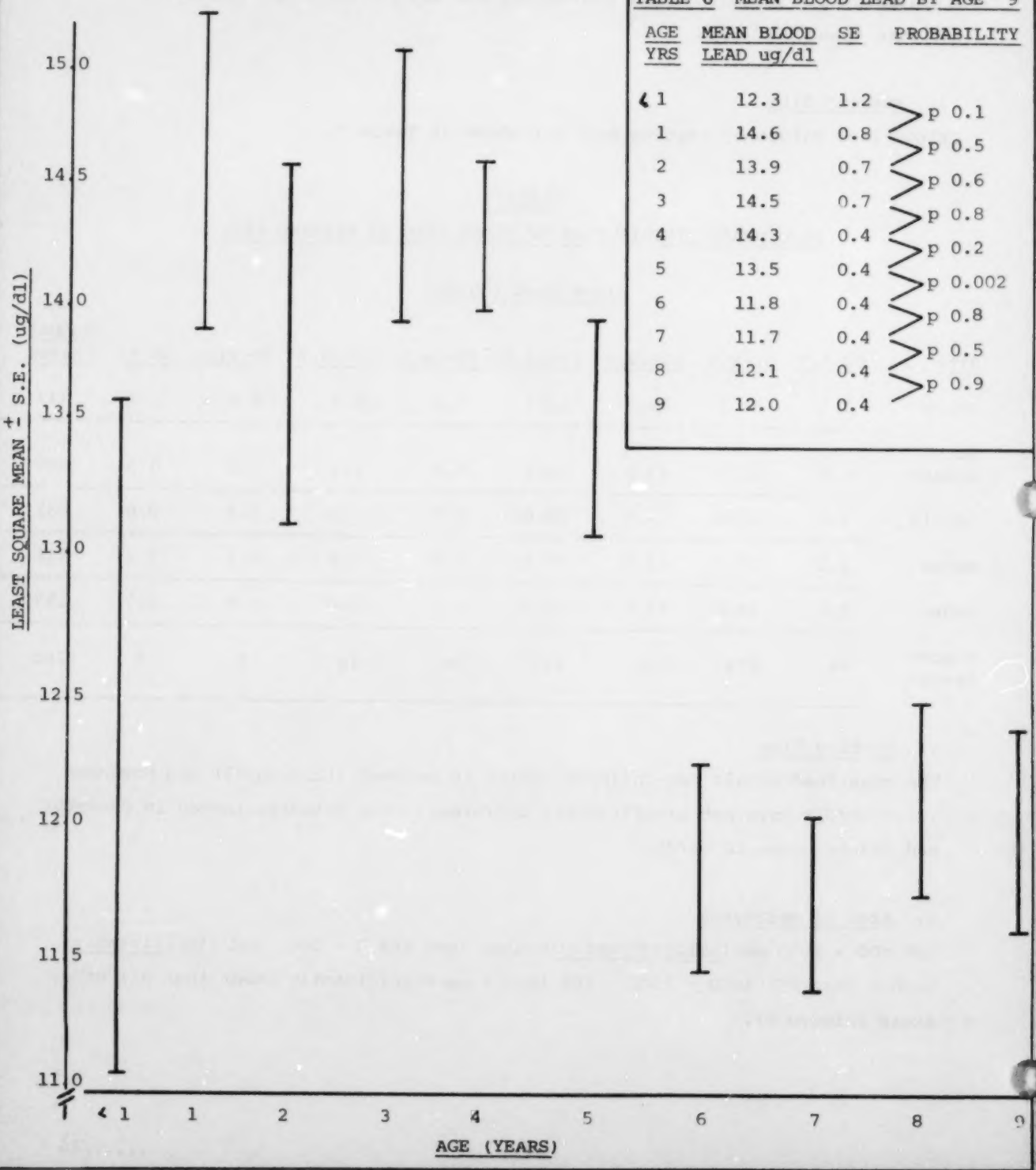
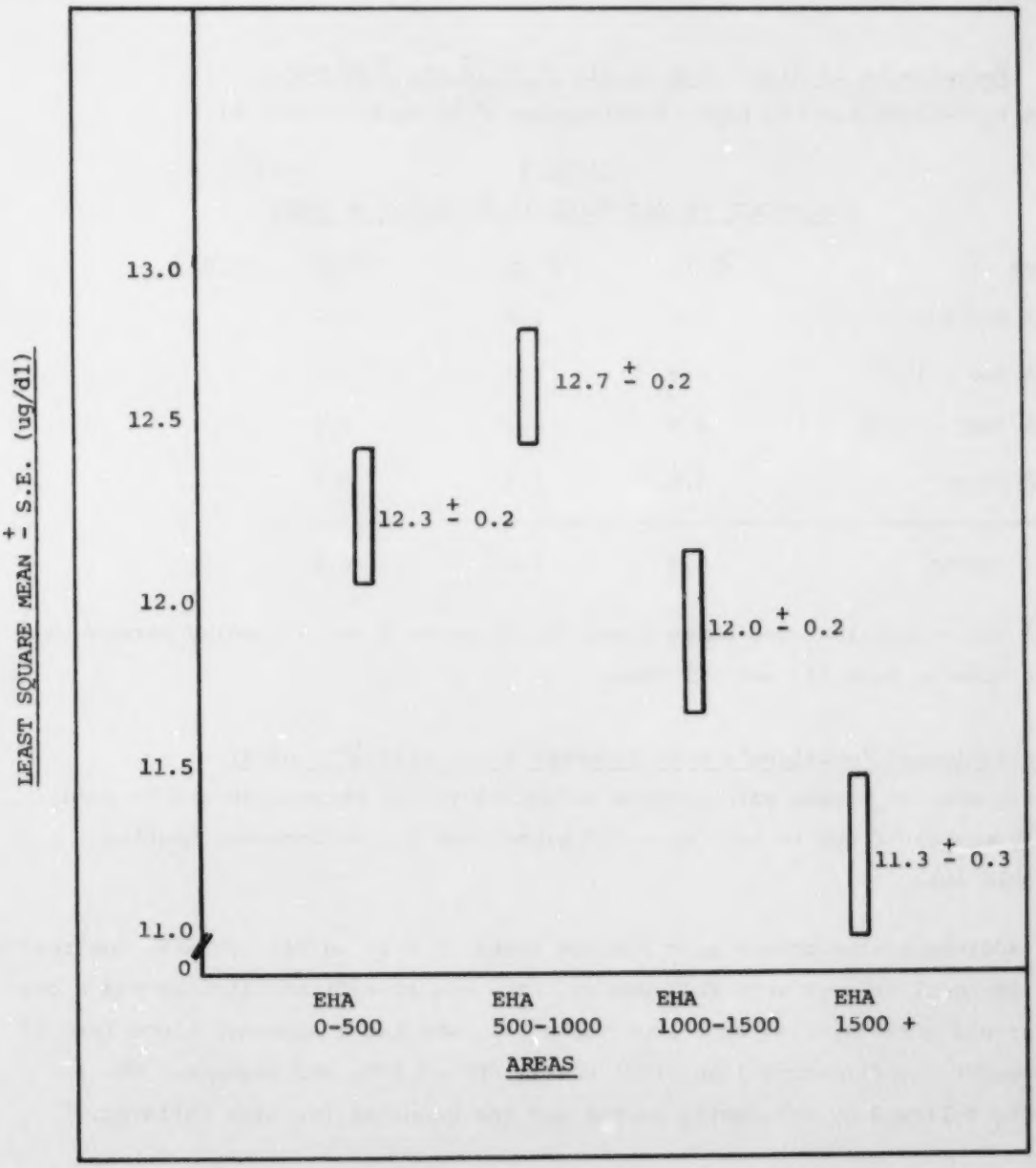


TABLE 6 MEAN BLOOD LEAD BY AGE 9

AGE YRS	MEAN BLOOD LEAD ug/dl	SE	PROBABILITY
< 1	12.3	1.2	> p 0.1
1	14.6	0.8	> p 0.5
2	13.9	0.7	> p 0.6
3	14.5	0.7	> p 0.8
4	14.3	0.4	> p 0.2
5	13.5	0.4	> p 0.002
6	11.8	0.4	> p 0.8
7	11.7	0.4	> p 0.5
8	12.1	0.4	> p 0.9
9	12.0	0.4	

FIGURE 5

MEAN BLOOD LEAD BY AREA OF RESIDENCE



PROBABILITY VALUES

EHA 0 - 500	0.1962	0.4430	0.0042 *
	EHA 500-1000	0.0357 *	0.0001 *
		EHA 1000-1500	0.0411 *
			EHA 1500 +

6) Zone of Residence

Comparison of blood lead levels of children aged 0 - 9 by zones (Figure 6) and an examination of the blood lead levels by street suggested that levels were higher on Morse, Logan and Eastern Avenues (mostly west of CMC). Zones 8 and 11 were significantly higher than the other housing zones, using a general linear model correcting for sex and looking specifically at children aged 0 - 9 (Figure 7 and Table 8)

7) Percentages of Blood Lead Levels ≥ 30, ≥ 25, ≥ 20 ug/dl

EHA 500 - 1000 had the highest percentage ≥ 30 ug/dl (Table 9).

TABLE 9

PERCENTAGE OF ALL BLOOD LEAD LEVELS BY AREA

Area	$\geq$ 20	$\geq$ 25	$\geq$ 30 ug/dl
EHA 0 - 500	7.7	1.8	0.2
EHA 500 - 1000	6.8	2.5	1.0
EHA 1000 - 1500	4.9	0.7	0.2
EHA 1500 +	3.5	1.2	0.2
TOTAL	5.9	1.6	0.4

EHA 500 - 1000 included Zones 8 and 11. Figures 8 and 9 display percentages for Zone 8, Zone 11, and all Zones.

Evaluation of Individuals with Screened Blood Lead ≥ 30 ug/dl

There were 10 people with average screening values between 30 and 54 ug/dl. Only one was found to have elevated blood lead on confirmatory testing (Table 10).

In addition, nine others with average tests 25 - 29 ug/dl, but with one reading of 30 ug/dl or over were followed up. The one significant finding was a one-year-old girl (sibling of # 1 on Table 10), who had a screened blood lead of 29 ug/dl, confirmatory lead of 26 ug/dl, FEP of 100, and anaemia. She is being followed by her family doctor and the Hospital for Sick Children.

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FIGURE 6

MAP OF ZONES

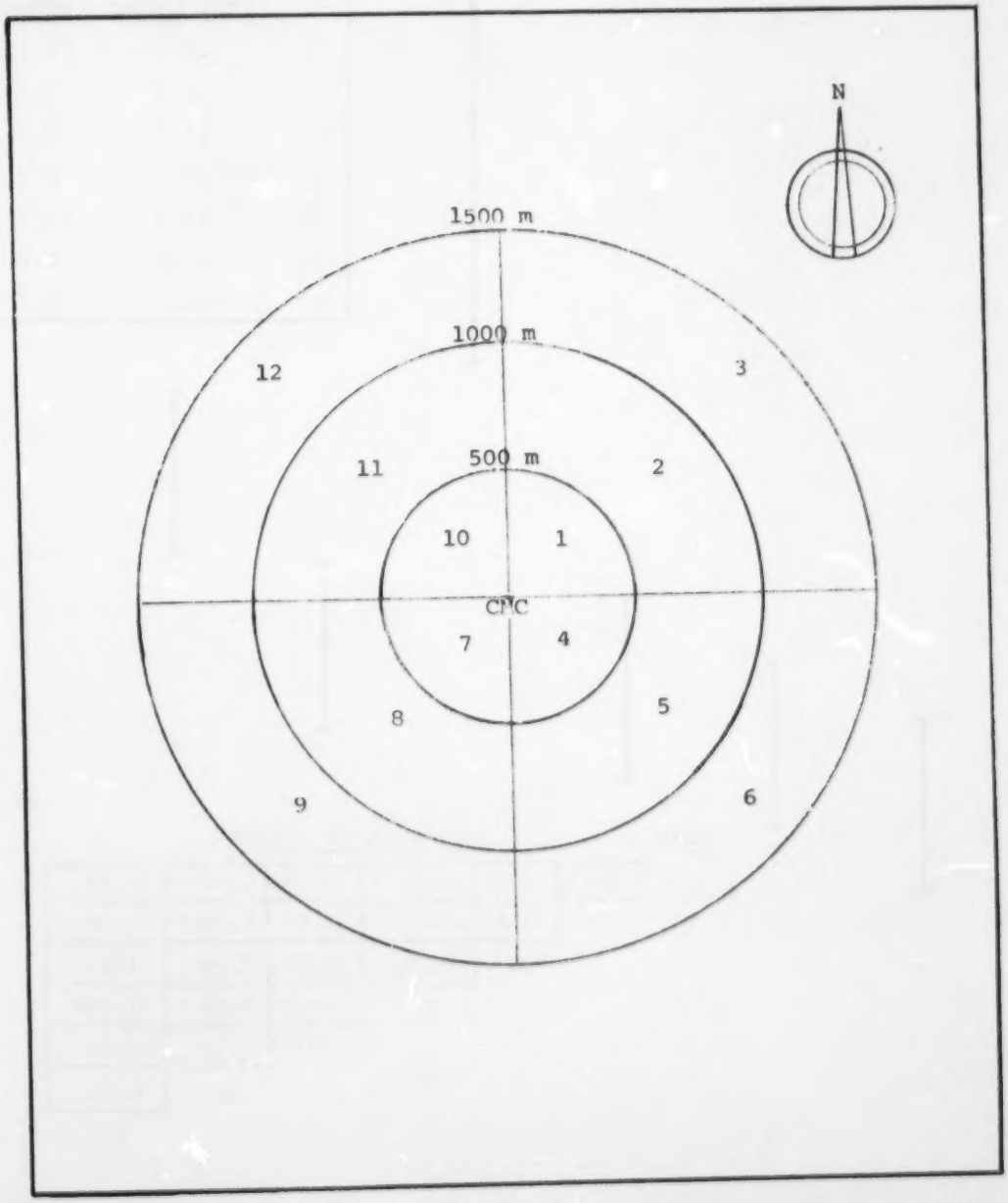
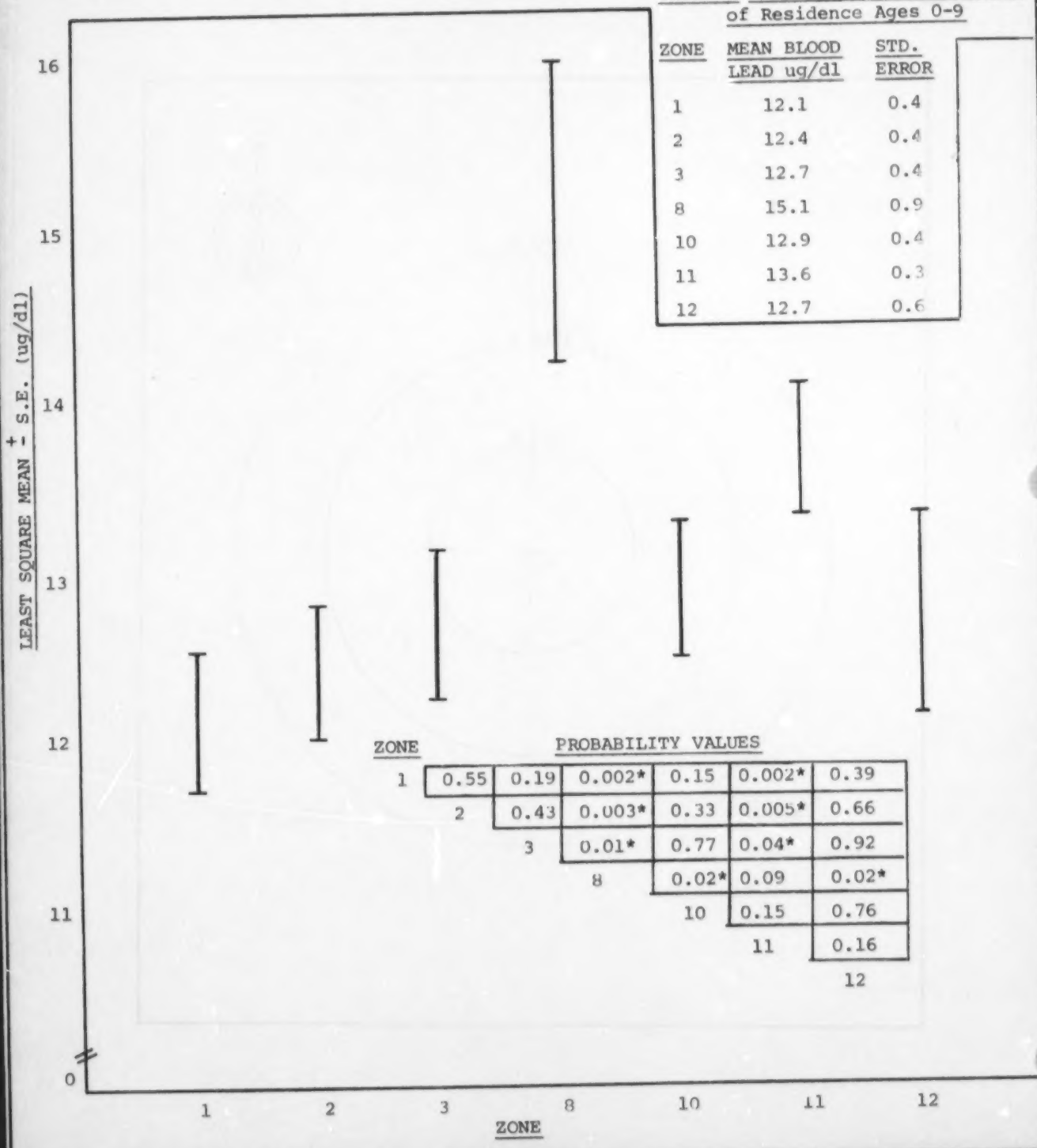


FIGURE 7

MEAN BLOOD LEAD BY ZONES OF RESIDENCE AGES 0 - 9

TABLE 8 Mean Blood Lead By Zones of Residence Ages 0-9

ZONE	MEAN BLOOD LEAD ug/dl	STD. ERROR
1	12.1	0.4
2	12.4	0.4
3	12.7	0.4
8	15.1	0.9
10	12.9	0.4
11	13.6	0.3
12	12.7	0.6



ZONE	PROBABILITY VALUES					
1	0.55	0.19	0.002*	0.15	0.002*	0.39
2		0.43	0.003*	0.33	0.005*	0.66
3			0.01*	0.77	0.04*	0.92
8				0.02*	0.09	0.02*
10					0.15	0.76
11						0.16
12						

FIGURE 8

PERCENTAGE OF ALL BLOOD LEAD LEVELS
≥20, ≥25, ≥30; ALL AGES; BY ZONES

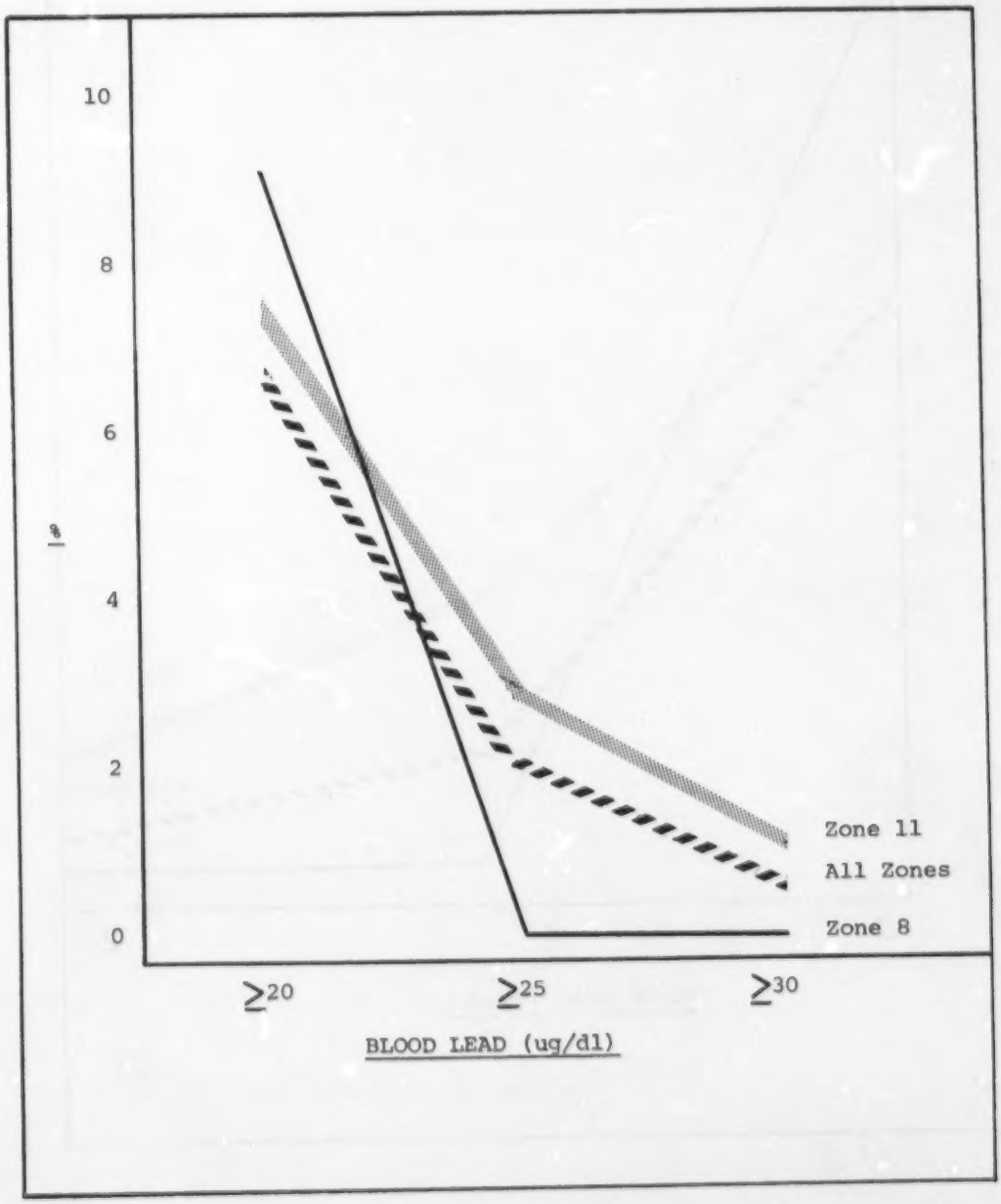


FIGURE 9

PERCENTAGE OF ALL BLOOD LEAD LEVELS
≥20, ≥25, ≥30; AGES 0 - 9; BY ZONES

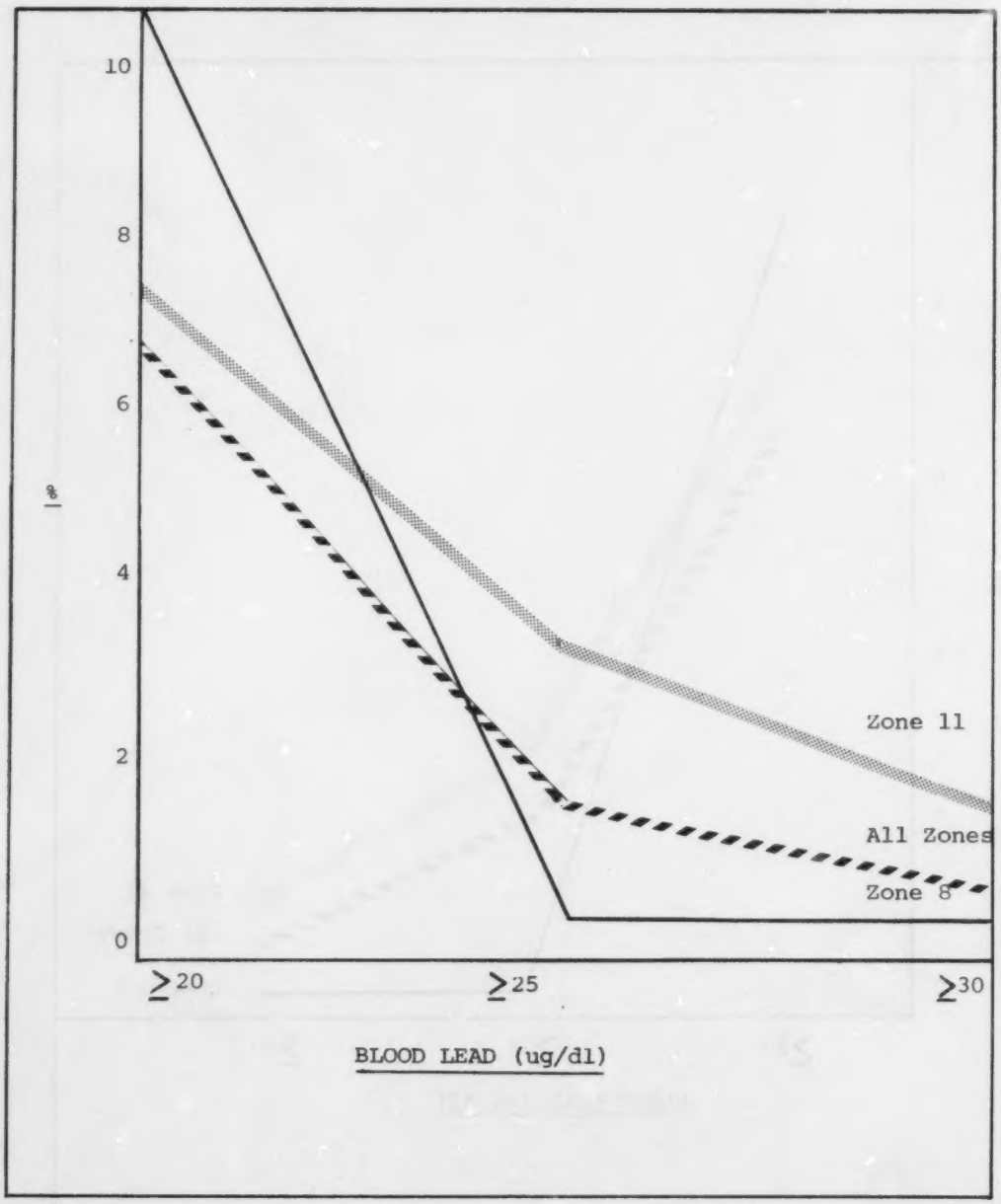


TABLE 10

INDIVIDUALS WITH SCREENED BLOOD LEAD $\geq$ 30 UG/DL

No.	Age Range	Sex	Blood Pb Screened ug/100ml	Confirmatory Pb * (ug/100 ml)	FEP (ug/100 ml)	Possible Lead Sources Identified **
1	0 - 4	M	32	19	27	Gas station & car painter near; bare soil in yard; traffic & dust.
2	0 - 4	M	39	24	34	Sand blasted house across street; blowtorched old paint in summer; father is a riveter and has worn work clothes home.
3	0 - 4	F	44	10	10	No source identified.
4	5 - 9	F	32	23	23	Ate sand at 1 year; anaemic in past; gas fumes in house twice a week from attached restaurant cleaning stoves; gas station& auto body shop near; traffic; nearby houses sand blasted.
5	10 - 14	M	41	4	-	Gas station near; traffic; dust.
6	10 - 14	M	30	15	31	Scraped old paint off porch in summer; old paint in house for 80 years.
7	10 - 14	M	30	21	23	Gas station near, and dust.
8	15 - 44	M	44	13	10	Paint & auto body shop near; tannery near; dust.
9	45 +	M	54	34	33	Makes pistol shot; smokes 1½ packs cigarettes/day; busy parking lot acros street.
10	45 +	F	32	-	-	- - - - - - -

AREA OF RESIDENCE

EHA 0 - 500	: 1
EHA 500 - 1000	: 8
EHA 1000 - 1500	: 1
EHA 1500 +	: 0

STREET OF RESIDENCE

Brooklyn Ave.	: 1
Coady	: 1
Eastern	: 3
Leslie	: 2
Logan	: 2
Minto	: 1

* Blood collected at the Hospital for Sick Children, using the Provincial Laboratory, except # 5, who saw a private physician using a private laboratory.

** Residential soil lead results are pending.

...../24

Schoolyard Soil Lead Testing

Soils of 10 school yards were tested for lead content in the fall of 1982 (Table 11). There were no readings above 600 parts per million, the concentration considered excessive by the Ministry of the Environment.

TABLE 11

SCHOOLYARD SOIL LEAD TESTING

SCHOOL	SAMPLE SITE	CODE	LEAD CONTENT (ppm dry wts)	APPROX. DISTANCE FROM CMC & DIRECTION
Bruce	play area (sand)	1-1	13	200 metres NW
	lawn	1-2	130	
	playfield (sod)	1-3	50	
	jumping pit	1-4	5	
	play area	1-5	13	
St. Joseph Primary	lawn	3-7	33	500 metres N
	lawn	3-2	18	
St. Joseph Senior	lawn	4-1	75	700 metres N
	lawn	4-2	190	
	along side fence (sand) (parking area)	4-3	580	
Leslie	play area (sand)	5-1	9	900 metres N
	lawn	5-2	58	
	lawn	5-3	88	
Morse	lawn	6-1	260	700 metres W
	lawn	6-2	220	
	play area (sand)	6-3	11	
	playing field (sod)	6-4	55	
	lawn	6-5	14	

Air Lead Monitoring Adjacent to CMC

The Ministry of the Environment provided data on air sampling at the stations around CMC. Figure 10 displays monthly geometric mean air lead in suspended particulates for station 31058 east of CMC, the station with the highest values. Figure 11 displays monthly geometric mean air lead in suspended particulates for station 31064 on Berkshire Avenue, north of CMC. Monthly averages have gradually fallen since 1974 and have been acceptable since 1980. The daily criteria have been exceeded upon two occasions, one in January and one in August 1982.

LEAD IN SUSPENDED PARTICULATES FOR STATION 31058

LOCATION: CANADA METAL CO. LIMITED

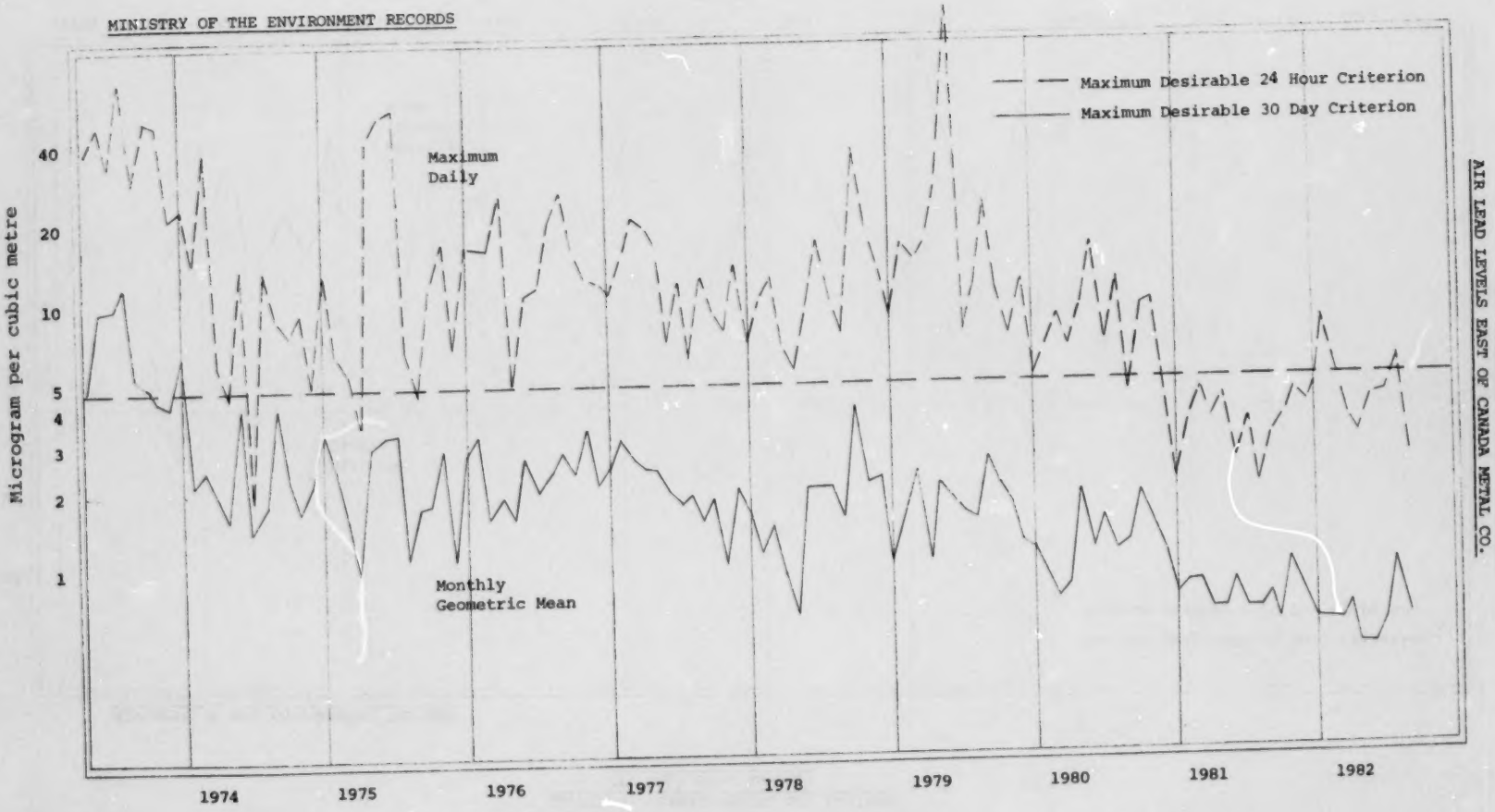


FIGURE 10

AIR LEAD LEVELS EAST OF CANADA METAL CO.

LEAD IN SUSPENDED PARTICULATES FOR STATION 31064

LOCATION: CANADA METAL CO. LIMITED
(17 Berkshire Avenue)

MINISTRY OF THE ENVIRONMENT RECORDS

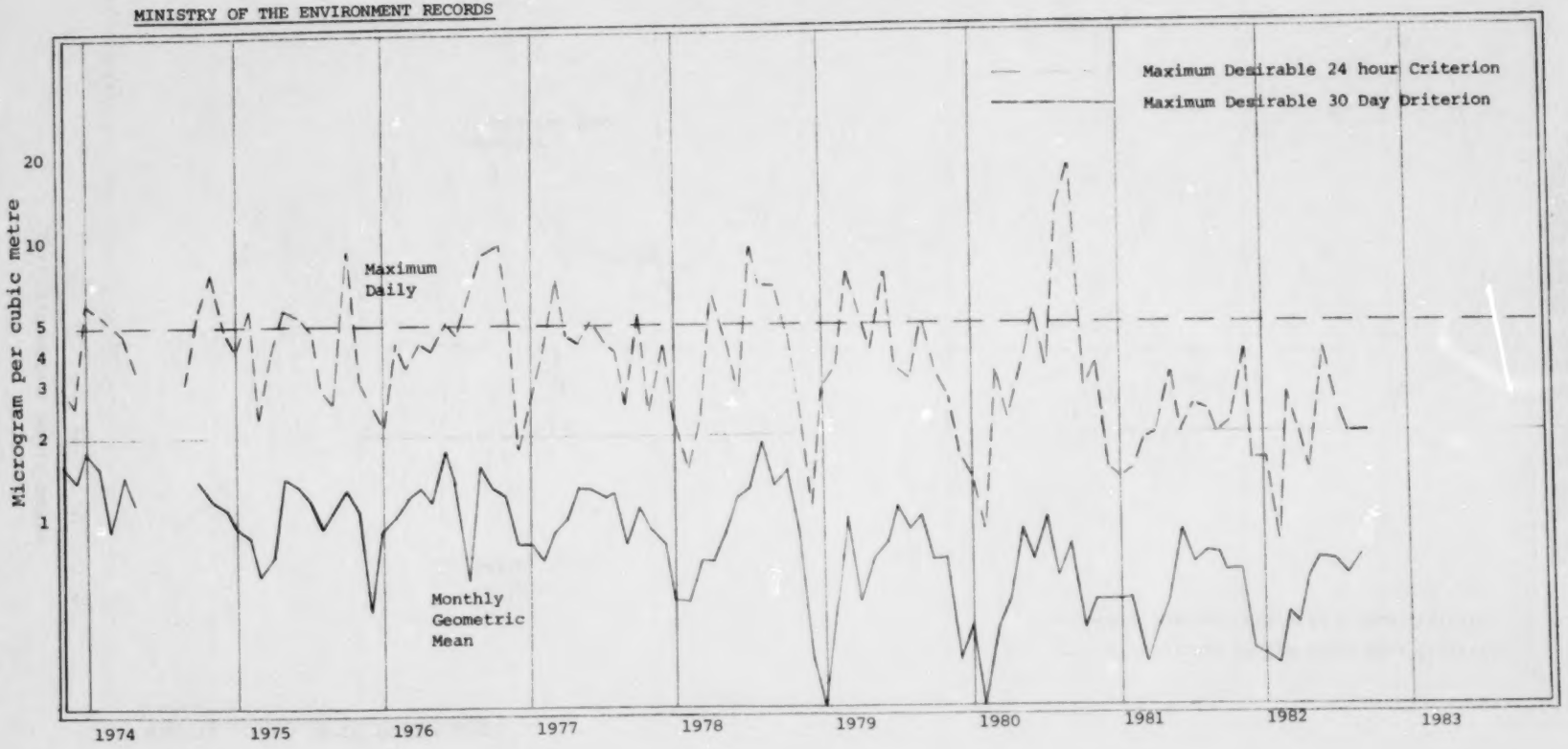


FIGURE 11
AIR LEAD LEVELS NORTH OF CANADA METAL CO.

Cost

Personnel, materials, and transportation for planning, implementing and evaluating South Riverdale community blood lead screening and the study of Grade 1 children cost approximately $80,000.00. Approximately 20% of that amount was due to the Grade 1 study.

DISCUSSION

Response Rate and Mean Blood Lead Levels

The response rate was gratifying but individuals screened were not a randomly selected sample of the population. Thus, results of those tested cannot be extrapolated either to the target age group or the total population in the target area. The mean blood lead level of 12.1 $\pm$ 5.1 ug/dl compares favourably with the June, 1977 screening of 77 people with mean blood lead of 14.6 ug/dl. Mean values were not reported for the 1973-74 surveys conducted by the Department, but for 2,302 people screened in Toronto in the summer of 1974, 57% had values $\geq$20 ug/dl as compared with 5.9% in this survey. 15% had values $\geq$ 30 in 1974 as compared to 0.4% in 1982. 0.3% of the screened target age groups had levels $\geq$ 30.

The U.S. National Health and Nutrition Examination Survey II (NHANES II), [9] studied a stratified sample of people aged six months to 74 years, urban and non-urban. There was a 37% decrease in mean blood lead levels from 15.8 ug/dl in 1976 to 10.0 ug/dl in 1980.

Sex Difference

Males had a significantly higher mean lead level than females, 13.1 ug/dl and 11.2 ug/dl respectively. Similar sex differences are reported in the NHANES II study for males and females six years of age and over. It may be postulated that the difference is related to differences in biology, in exposure to lead, or in possibly poorer hand washing by boys than girls before the finger prick test.

Age Differences

Children aged 0 - 9 in the target area had a mean blood lead level of 12.6 $\pm$ 4.5 ug/dl. Children aged 0 - 5 had significantly higher lead levels than those aged 6 - 9. A contributing factor to this might be the smaller sample size of children aged 0 - 4. However, the NHANES II study reported

...../28

similar findings. Again differences in biology or in greater lead exposure because of playing in dirt/sand and putting things into mouths etc., are possible explanations.

Mean blood lead of children aged 6 - 9 varied between 11.7 and 12.1 ug/dl according to age. In a 1981 study of 308 children 0 - 18 years of age visiting the Hospital for Sick Children emergency room due to minor injuries, the mean blood lead level was 9.1 $\pm$ 5.3 ug/dl.[10] Such children were not a random sample of Toronto or EHA 0 - 1500. Blood samples were tested at the Provincial Laboratory which generally reports lower levels than capillary samples tested at ESA.

Females aged 15 - 44 years in the target area had a mean blood lead level of 10.1 $\pm$ 4.1 ug/dl. In a 1982 study[10] of 552 cord bloods at Toronto East General Hospital, the mean blood lead level was 6.0 $\pm$ 4.8 ug/dl with 3.6% above 20 ug/dl, but none above 25 ug/dl. Such cord bloods were not a random sample of EHA 0 - 1500.

Testing Site

Observed differences associated with testing site are likely due to the areas/zones of residence for those attending that site. Analysis by residence is more helpful.

Testing Time

There was no significant difference in screening results between October and November. Lead exposure may be increased in the summer months and higher blood levels in summer and early fall can be expected.

Area of Residence

The mean lead level was significantly lower in EHA 1500 + than in the other areas. This could be a true finding. But it could be biased by the smaller sample size and self-selection for screening. Because EHA 500 - 1000 was higher than other areas, zones within areas were examined.

...../29

Zone of Residence

Screened residents of zones 8 and 11 had significantly higher mean blood lead levels compared to screened residents of other zones whether aged 0 - 9 or all ages. Morse, Logan and Eastern had higher percentages $\geq$ 15 ug/dl. In June 1974, Dr. Horn found a mean blood lead level of 26 - 29 ug/dl in 63 children on Morse, Logan and Carlaw (zones 8 and 11), with no evidence of an east-west axis to relate it to CMC or a north-south axis to relate it to the expressway.(3)

The findings in zones 8 and 11 could be biased by the nonrandom self-selection of screened volunteers. However, that bias operated to some degree in all zones. Possible sources of lead exposure in zones 8 and 11 include traffic of the Don Valley/Gardiner Expressways which are upwind, industrial stack emissions other than CMC, soil lead content, and a greater prevalence of leaded paint, renovation work and individuals with occupation/hobby lead exposure.

Percentage of screened lead values above various levels

EHA 500 - 1000 tended to have a higher percentage of values $\geq$ 25 ug/dl. This was primarily due to zones 8 and 11 and correlates with their higher means.

Evaluation of individuals with screened blood lead $\geq$ 30 ug/dl

No cases of lead poisoning were identified. The detection rate for confirmed elevated blood lead ($\geq$ 30 ug/dl) was 0.04% for all individuals screened and 0% for all target age group individuals screened. The one case of elevated blood lead was likely due to hobby exposure to lead plus smoking and did not require medical treatment.

...../30

Soil Lead Levels

The Ministry of the Environment considers soil lead greater than 600 p.p.m. to be excessive. The 1975 Report of the Lead Data Analysis Task Force [11] demonstrated significant (1% level) increase in child blood lead levels when the estimated residential soil lead level exceeded 1000 p.p.m. This held for CMC alone and for all three Toronto smelters combined.

Schoolyard soils were less than the 600 p.p.m. level,

580 p.p.m. in sand next to a fence beside a parking area at St. Joseph Senior School is likely due to auto exhaust contamination and unlikely to be a frequented playsite for children aged 0 - 9.

Residential soil lead levels are pending for individuals with screened blood lead $\geq$ 30 ug/dl.

Previous soil replacement around CMC was confined to 37 sites with $\geq$ 3000 p.p.m. The exposure of children aged 0 - 9 in EHA 0 - 1500 to soil with $\geq$ 600 p.p.m. cannot be determined from present data. This includes in particular the children aged 0 - 5 in EHA 0 - 500 and zones 8/11 who have significantly higher blood lead levels than those aged 6 - 9.

Air Lead Levels

CMC air lead emissions have been within provincial standards since December 1980 except for two brief excursions due to CMC yard cleaning and roofwork at a nearby premise.

There are no permanent monitors in EHA 500 - 1000, including zones 8 and 11.

The U.S. NHANES II study reported a temporal relationship between decreasing blood lead levels and decreasing lead used in gasoline (Figure 12). [12]

Cost

Excluding the Grade 1 study, the cost per detected case of confirmed elevated blood lead was approximately $64,000.00. In addition, one small child was found with anaemia. Berwick and Komaroff reported [13] that lead screening is less effective than other strategies for reducing lead exposure when the prevalence of lead poisoning in children is less than 6.7%.

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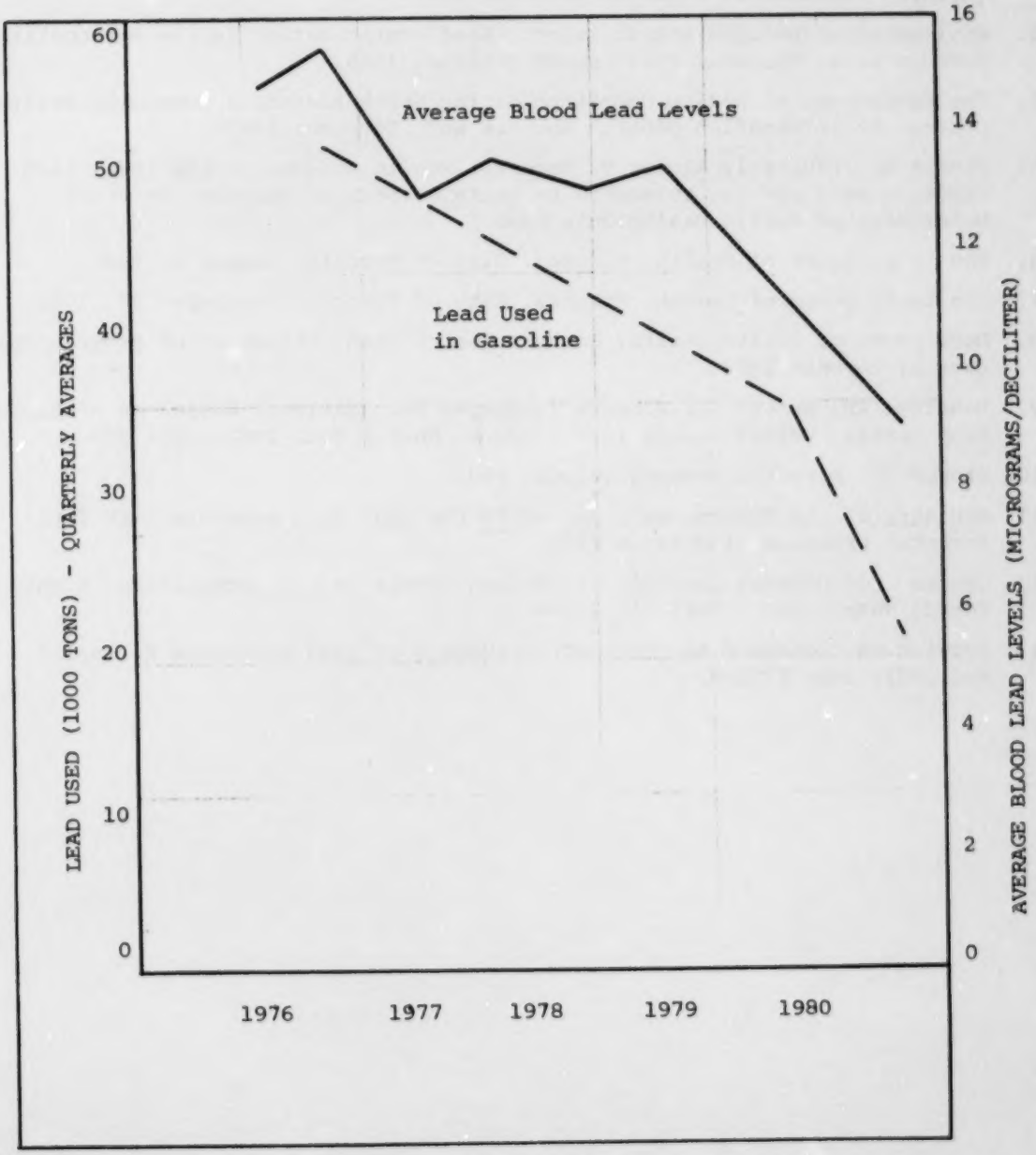
FIGURE 12

LEAD USED IN GASOLINE AND AVERAGE NHANES II BLOOD LEAD LEVELS
1976 - 1980



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APPENDIX 1

City of Toronto

Department of Public Health

City Hall, Toronto, Ontario, Canada M5H 2N2

A. S. MACPHERSON, M.D., M.Sc.,
Medical Officer of Health

Reply Attention: Dr. L. J. Erb
Area Physician
Eastern Health Area
815 Danforth Avenue

Telephone: 469-0554

September 15, 1982

RESIDENTS OF EASTERN HEALTH AREA.

Dear Friends:

The Eastern Health Area of the City of Toronto, Department of Public Health, in co-operation with the South Riverdale Community Health Centre, is conducting a lead testing programme in selected schools October 4 to October 7, 1982, inclusive, to measure blood lead levels of South Riverdale residents.

We urge all residents to attend these clinics. Because of the possible effects of lead on infants and young children, we particularly encourage children up to ten years of age and women of child-bearing years (15-45 years) to be tested.

It is important to have as many people attend these clinics as possible, as there has been community concern regarding lead levels.

If you have any questions, telephone Dr. Jean Erb at the Eastern Health Area, 469-0554, or Jeanie Zinkand at South Riverdale Community Health Centre, 461-2493.

Yours truly,

A. S. Macpherson, M.D., M.Sc.,
Medical Officer of Health

AEW:eb
Encl.

INSERT "PROTECT YOUR FAMILY" BROCHURE

PROTECT YOUR FAMILY

LEAD TESTING CLINICS

Do you know lead is a health hazard?

Do you know what your blood lead level is?

Because of the possible harmful health effects of lead contamination, especially with infants and young children, we are doing finger prick tests from 9:00 a.m. to 8:00 p.m. at the following locations:

October 4	Bruce Public School 51 Larchmount Avenue
October 5	St. Joseph's School 176 Leslie Street
October 6	Leslie Street School 254 Leslie Street
October 7	Morse Street School 180 Carlaw Avenue

ALL RESIDENTS ARE URGED TO COME FOR A TEST

(and in particular children 10 years or younger and women of child bearing age)

Free balloons for children tested!

For further details telephone 469-0554 or 461-2493.

City of Toronto Department of Public Health, Eastern Health Area in co-operation with the South Riverdale Community Health Centre.

檢驗血內含鉛的成份

閣下知否鉛對健康有危險？

閣下知道自己的血含鉛之成份多少否？

因為鉛對健康是有害的，尤以對嬰孩及小童的健康為甚，我們將於下列日期及地點為市民在手指抽血檢驗，時間為上午九時至晚上八時：

十月四日	Bruce Public School 51 Larchmount Avenue
十月五日	St. Joseph's School 176 Leslie Street
十月六日	Leslie Street School 254 Leslie Street
十月七日	Morse Street School 180 Carlaw Avenue

請所有市民擁躍前往接受檢驗(尤以十歲以下之小孩及生育期間的婦女)。

多倫多市公共衛生部門東區健康分局與 South Riverdale 社區健康中心合辦。

將有汽球贈送接受檢驗之小孩！

欲知詳情，請電 469-0554

或 461-2493.

ΠΡΟΓΡΑΜΜΑ ΕΞΕΤΑΣΗΣ ΓΙΑ ΜΟΛΥΒΔΟ

Ξέρετε ότι ὁ μόλυβδος στό αἷμα ἀποτελεῖ κίνδυνο γιά τήν ὑγεία σας;

Ξέρετε σέ τί ἐπίπεδο βρίσκεται ὁ μόλυβδος στό αἷμα σας;

Ἐπειδή ἡ προσβολή ἀπό μόλυβδο μπορεῖ νά ἔχει βλαβερή ἐπίδραση στήν ὑγεία σας, καί ἰδίως στά νήπια καί στά μικρά παιδιά, διεξάγουμε ἐξετάσεις αἵματος μέ κέντρισμα τοῦ δαχτύλου ἀπό τίς 9:00 π.μ. ὡς τίς 8:00 μ.μ. στίς παρακάτω τοποθεσίες:

4 Ὀκτωβρίου	Bruce Public School 51 Larchmount Avenue
5 Ὀκτωβρίου	St. Joseph's School 176 Leslie Street
6 Ὀκτωβρίου	Leslie Street School 254 Leslie Street
7 Ὀκτωβρίου	Morse Street School 180 Carlaw Avenue

ΟΛΟΙ ΟΙ ΚΑΤΟΙΚΟΙ ΠΑΡΑΚΑΛΟΥΝΤΑΙ ΝΑ ΕΛΘΟΥΝ ΓΙΑ ΕΞΕΤΑΣΗ.

(ἰδίως τά παιδιά μέχρι 10 ἐτῶν καί οἱ γυναῖκες πού εἶναι σέ ἡλικία τεκνοποίησης)

Δῆμος Τορόντο

Ὑπηρεσία Δημόσιας Ὑγείας

Ὑγειονομικό Γραφεῖο Ἀνατολικῆς Περιφέρειας

σέ συνεργασία μέ τό Κοινοτικό

Ὑγειονομικό Κέντρο τοῦ South Riverdale

Δωρεάν μπαλόνια γιά ὅσα παιδιά ἐξεταστοῦν!

Γιά λεπτομέρειες τηλεφωνῆστε στό 469-0554 ἤ στό 461-2493.

APPENDIX 3

NOTICE TO PARENTS

The City of Toronto, Department of Public Health, Eastern Health Area
is holding a

LEAD TESTING CLINIC

at

BRUCE PUBLIC SCHOOL
51 Larchmount Ave.
MONDAY, OCTOBER 4, 1982
9:00 a.m. to 8:00 p.m.

TEST FOR LEAD IN THE BLOOD

The Toronto City Health Department, in co-operation with South Riverdale Community Health Centre, is conducting a lead screening programme.
This Clinic is part of *LEAD WEEK.*
ALL RESIDENTS and in particular CHILDREN UP TO 10 YEARS OF AGE and WOMEN OF CHILDBEARING AGE (15 to 45 years) are urged to come for a finger prick test.

A Consent, signed by a parent or guardian, is necessary for all children under 16 years of age.
Consents signed for earlier tests are not good for this Clinic.
Each person tested will receive their blood lead test results and recommendations by mail.

ΕΞΕΤΑΣΗ ΑΙΜΑΤΟΣ ΓΙΑ ΜΟΛΥΒΔΟ

Η Υγειονομική Υπηρεσία τοῦ Δήμου τοῦ Τορόντο, σέ συνεργασία μέ τό Υγειονομικό Κέντρο τῆς Κοινότητας South Riverdale, ἔχει βάλει σ'ἐφαρμογή ἕνα πρόγραμμα ἐξέτασης γιά μόλυβδο στά πλαίσια τῆς Ἑβδομάδας Μόλυβδου.

ΟΛΟΙ ΟΙ ΚΑΤΟΙΚΟΙ παρακαλοῦνται νά ἔρθουν γιά ἐξέταση αἵματος πού γίνεται μέ κέντρισμα τοῦ δαχτύλου - καί ἰδίως

ΤΑ ΠΑΙΔΙΑ ΜΕΧΡΙ 10 ΕΤΩΝ

καί

ΟΙ ΓΥΝΑΙΚΕΣ ΠΟΥ ΕΙΝΑΙ ΣΕ ΗΛΙΚΙΑ ΤΕΚΝΟΠΟΙΗΣΗΣ - (15-45 ἐτῶν)

Χρειάζεται γραπτή συγκατάθεση γονέα ἤ κηδεμόνα γιά ὅλα τά παιδιά ἡλικίας μέχρι 16 ἐτῶν. Συγκαταθέσεις πού ἔχουν ὑπογραφεῖ γιά προηγούμενες ἐξετάσεις δέν ἰσχύουν γι αὐτή τήν ἐξέταση.

Ὅσοι ἐξεταστοῦν θά λάβουν ταχυδρομικά τ'ἀποτελέσματα τῆς ἐξέτασης αἵματος καί σχετικές ὁδηγίες.

檢驗血內含鉛的成份

多市之公共衛生部門與 South Riverdale 社區健康中心合辦檢驗血內含鉛的成份.這檢驗是鉛週之其中一項檢驗。

請市民擁躍前往接受檢驗,這是在手指抽血檢驗,十歲以下之兒童及生育期間的婦女(十五歲至四十五歲)尤應前往接受檢驗。

凡十六歲以下之兒童接受這項檢驗必須由父母或監護人簽字許可,今次之檢驗需要重新申請。

接受這項檢驗之人士將接到書面通知有關結果及建議.

APPENDIX 4

City of Toronto
DEPARTMENT OF PUBLIC HEALTH

Request for Blood Sample Test

Name: _____
SURNAME FIRST NAME

Address: _____
POSTAL CODE

Telephone: _____ Sex (M or F): _____ Age: _____

I request that a physician or nurse obtain sufficient blood from a finger-prick of the above named for analysis for lead.

Date: _____ Signature: _____
PARENT OR GUARDIAN

Δῆμος Τορόντο
ΥΠΗΡΕΣΙΑ ΔΗΜΟΣΙΑΣ ΥΓΕΙΑΣ

Αἴτηση γιά Ἐξέταση Αἵματος

Ὀνοματεπώνυμο _____
ΕΠΩΝΥΜΟ ΟΝΟΜΑ

Διεύθυνση _____
ΤΑΧ. ΤΟΜΕΑΣ

Ἀριθμός
Τηλεφώνου _____ Φύλο (Α ἡ Θ) _____ Ἡλικία _____

Αἰτοῦμαι τή λήψη τῆς ἀπαιτούμενης ποσότητας αἵματος μέ κέντρισμα τοῦ δαχτύλου τοῦ ἀνωτέρω προσώπου ἀπό γιατρό ἤ νοσοκόμα μέ σκοπό τήν ἀνάλυση γιά μόλυβδο.

Ἡμερομηνία _____ Ὑπογραφή _____
ΓΟΝΕΑΣ/ΚΗΔΕΜΟΝΑΣ

多倫多市
公共衛生部門

申請驗血

姓名 _____
姓

地址 _____
郵政號碼

電話 _____ 性別 □男 □女 年歲 ____

我請求醫生或護士替上述人士在手指抽血以檢驗鉛的成份。

日期 _____ 簽名 _____
父母或監護人

INSERT "GET THE LEAD OUT" BROCHURE

INCLUDES:

SAFETY GUIDELINES

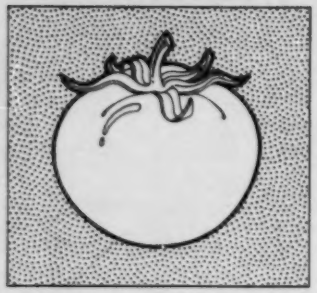
TIPS FOR GARDENERS

ADVICE FOR CONTRACTORS, RENOVATORS & DO-IT-YOURSELFERS

This City of Toronto Department of Public Health pamphlet has been developed by the South Riverdale Community Health Centre in consultation with the Ontario Ministry of the Environment and the Information and Communication Services Division of the Department of the City Clerk, City of Toronto

LEAD OUT!

LEAD CONTAMINATION IN THE GARDEN



There's something special about food you've nurtured and grown yourself. Somehow it always tastes better than store-bought produce. There's satisfaction in knowing that you're providing wholesome fare and at the same time taking the bite out of inflation. There's also the satisfaction that comes from knowing that the food you put on the table is free from possibly harmful chemical contaminants. Or is it?

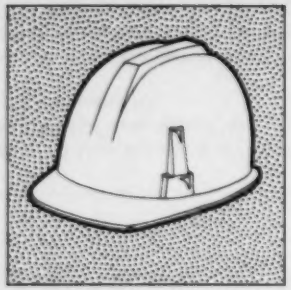
The following tips will help ensure that your home-grown produce remains as lead free as possible.

GARDENING TIPS

- If you're planning on planting a vegetable garden and you're concerned about possible lead contamination of the soil you can call the Ministry of the Environment at 965-4516 for a soil test.
- For the purposes of this pamphlet we divide garden produce into three groups: root plants, such as beets, carrots and onions; leafy plants, such as lettuce, cabbage, beet leaves and chard; and fruiting plants, such as tomatoes, cucumbers, squash and beans. To be prudent, gardeners with soil levels of 0-600 ppm may grow any plants; those with 600-1000 ppm soil levels should limit gardening to leafy plants and fruiting plants; over 1000 ppm should limit gardening to fruiting plants.
- Acidic soil can actually help plants absorb lead. Ideally the soil should be neutral. This is indicated by a pH level of between 6.5 and 7.0. If the pH level is below this the soil is acidic and lime should be added to bring the pH value as close to 6.5 as possible. Acid level testing kits are available from most hardware stores. Phosphorous, an element contained in most fertilizers can also help reduce root absorption of lead.
- Whenever possible keep growing areas away from roads, driveways, downspouts and buildings painted with leaded paint. (Outside paints manufactured prior to 1976 often contained high levels of lead). Some experts now believe that people living near "hot spots" for trace metals such as smelters, highways, incinerators, snow dumps or landfill sites should not grow vegetables for consumption at all — and certainly not without following the precautions noted here.
- You should always eat younger plants and replant often. Older plants are more likely to have absorbed higher lead levels.
- If eating leafy vegetables, peel and discard older outer leaves.
- Peel all root crops before eating.
- Carefully wash all produce, whether store-bought or home-grown, before eating.
- Likewise, you should always wash your hands after working outside and before preparing meals. And don't forget the kids, especially if they've been playing in the garden.
- Recent studies show vitamin C is an effective means of helping rid the body of excess lead. Foods high in vitamin C include green peppers, citrus fruits and juices and tomatoes.
- If you're planning on preserving your home-grown vegetables avoid using glazed pottery storage jars which contain lead.
- If using home-made compost, make sure that leaves and/or cut grass do not contain harmful levels of lead.

By following these practical and proven tips you'll be able to safely enjoy the bounty of your garden.

CONTROLLING LEAD EXPOSURE FOR CONTRACTORS, RENOVATORS & DO-IT-YOURSELFERS



LEAD CONTAMINATION

Lead contamination can be a health risk for contractors, renovators and do-it-yourselfers. Here are some on the job safety rules to follow to protect yourself from the harmful effects of lead.

ON THE JOB PRECAUTIONS

- Keep bystanders away from the work site. Close windows to prevent dust from entering the building while sandblasting. Inform neighbours so they can take similar precautions. Do not sandblast on a windy day.
- Never use a power sander indoors. This can create a dangerous amount of lead dust in the atmosphere.
- When spray painting, always wear a protective face mask.
- Avoid burning off old lead-based paint with an open flame as this vapourizes the lead which can then enter the bloodstream through breathing in fumes.
- When scraping off old lead-based paint, always wear protective clothing, such as coveralls, shoes, a hat and face mask. Protective clothing should be washed separately in cold water.
- Use drop cloths to catch paint chips when decorating. Chips should be sealed in plastic bags and stored out of reach of children until safely disposed.
- Eat well away from the work area—after thoroughly washing hands. Do not smoke with contaminated hands. Shower and shampoo at the end of the work day.
- Be aware of the symptoms associated with low lead contamination, particularly if your job exposes you to lead on a regular basis. Symptoms to look for include stomach pains, anaemia, constipation, general tiredness and poor color.
- The best way to protect your health is to avoid using paint that contains lead.
- If you are concerned about your exposure to lead see your family doctor.

Staff at the Ontario Ministry of the Environment will respond to complaints to ensure that renovations, sandblasting, etc. are carried out in conformity with current standards under the Ontario Environment Protection Act. If you have complaints and require assistance please telephone 424-3000.

LEAD CONTAMINATION: WHAT YOU SHOULD KNOW

If you live in certain sections of Toronto you may be exposed to above-average levels of lead from traffic and local industry.

This City of Toronto Department of Public Health pamphlet has been developed by the South Riverdale Community Health Centre in consultation with the Ontario Ministry of the Environment as part of its efforts to monitor and counteract this problem. The following information explains the issues and describes safeguards against the harmful effects of lead contamination.

LEAD SOURCES

Lead is found in the air, soil and vegetation in areas near smelters, highways, incinerators, industrial plants or land-fill sites. It is also present in a number of everyday products, such as lead-based paint, lead water pipes, colored newsprint or magazines, gasoline, insecticides, cigarette smoke, solder in cans, colored candles, and lead pottery glazes.

HOW IT ENTERS YOUR BODY

Lead is a poison that can enter your lungs through breathing or your stomach by digesting contaminated food. Skin absorption is minimal. While most of the lead absorbed is excreted through the kidneys, some is absorbed by the body's bone structure. This dormant poison often re-enters the bloodstream at times of illness. Lead poisoning primarily damages the nervous system, red blood cells and kidneys, causing varying degrees of damage.

SYMPTOMS OF LEAD POISONING

Identifying cases of lead poisoning can be difficult as the milder symptoms are often vague and similar to less serious health problems. Among the milder symptoms are increased fatigue, pallor, feeling run down, loss of appetite, irritability, sleep disturbances and behaviour changes. More serious symptoms include clumsiness, ataxia (lack of muscle co-ordination), weakness, abdominal pain, persistent vomiting, constipation and blackouts which may precede convulsions and coma.

HIGH RISK OCCUPATIONS

Research has shown that some jobs carry a higher risk of lead contamination. If you're involved in any of these professions, we strongly advise that you have your blood checked regularly for elevated lead levels by your own employee health service or your doctor.

You have a right under the Ontario Occupational Health and Safety Act to request information about the levels of lead to which you are exposed. Your employer is responsible for ensuring that you are not exposed to levels of airborne lead greater than 15 milligrams per cubic metre of air.

Jobs where lead contamination is more likely include: smelter workers, solderers, gas station attendants and auto mechanics, parking lot attendants (especially those in underground lots), construction workers (particularly those involved in sandblasting), painters and artists.

FOLLOW THESE GUIDELINES

Whether you're involved in one of these high risk jobs, or simply concerned about the possibility of lead contamination from the environment, here are a few proven, commonsense precautions anyone can take to protect themselves from the harmful effects of lead.

- Wash hands and foods carefully before eating and do not eat on the ground outside; always use a table.
- Keep your home clean; vacuuming and wet-dusting are more effective than dry-dusting. Your driveway and sidewalk should also be washed down regularly.
- Do not burn colored newsprint, magazines or wrapping paper in your barbecue or fireplace as lead from the ink can become dangerous fumes.
- Eat a well-balanced diet with particular emphasis on foods containing calcium and iron. Eat as few fatty foods as possible.
- If you plan to grow your own vegetables and are concerned about possible lead contamination in your soil, consult the section, "Lead Contamination in the Garden."
- If you are concerned about exposure to lead when renovating, follow the health guidelines set out in the section, "Controlling Lead Exposure for Contractors, Renovators and Do-It-Yourselfers".
- Pay special attention to your children's safety. Discourage kids from putting objects into their mouths, particularly things such as paint chips, dirt, colored paper or toys that may have been in lead-contaminated soil. It's also a good idea to lay sod or put old rugs or mats on bare spots at the ends of slides and near swings. And if you're planning a sandbox, make sure the sand used comes from an uncontaminated source.
- Whenever possible keep growing areas away

City of Toronto residents who would like more information on the subject of lead contamination should call their nearest Department of Public Health area office.

APPENDIX 7

City of Toronto

Department of Public Health

City Hall, Toronto, Ontario, Canada M5H 2N2

A. S. MACPHERSON, M.D., M.Sc.,
Medical Officer of Health

Reply Attention: Dr. L. J. Erb
Area Physician
Eastern Health Area

Telephone:

DEAR RESIDENT:

RE: BLOOD LEAD TESTING

We regret that you were not able to have your blood lead test during Lead Week, October 4 - 8, 1982.

The response from the community was greater than expected and our estimated supplies were not sufficient.

Clinic appointments are being offered to people who attended previously but were not tested because of lack of supplies.

We have a mailing list of those who attended the clinic on October 8, 1982, and were not tested. You may have friends who came to clinics on the other days and also were not tested. Please share this notice with them.

If your school child, for whom you had signed a consent, was not tested at school, you may make an appointment. The child must either be accompanied by a parent/guardian or bring with him a signed consent. Blank consent forms are available from the school nurse.

Clinics will be held BY APPOINTMENT ONLY on -

Monday	- November 22, 1982	- Eastern Health Area Office 815 Danforth Avenue	- 1:00-4:30 p. m.
Wednesday	- November 24, 1982	- St. Joseph's School 176 Leslie Street	- 4:00-8:00 p. m.
Thursday	- November 25, 1982	- Bruce Public School 51 Larchmount Avenue	- 4:00-8:00 p. m.

IF YOU WISH A BLOOD LEAD TEST -

PLEASE TELEPHONE 469-0897 FOR AN APPOINTMENT.

Yours sincerely,

Edward Ellis

Edward Ellis, M.D., M.P.H.,
Associate Medical Officer of Health

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APPENDIX 8

City of Toronto

Department of Public Health

City Hall, Toronto, Ontario, Canada M5H 2N2

A. S. MACPHERSON, M.D., M.Sc.,
Medical Officer of Health

Reply Attention: Dr. L.J. Erb
Area Physician
Eastern Health Area
Telephone: 469 - 0554

DEAR PARENT/GUARDIAN:

RE: BLOOD LEAD TESTING

We regret that your child was not able to have his/her blood lead test done during Lead Week, October 4 to 8, 1982.

The response from the community was greater than expected, and our estimated supplies were not sufficient.

If you wish your child to have this test, please sign and return the attached consent to the school nurse.

Yours sincerely,

Edward Ellis

Edward Ellis, M.D., M.P.H.,
Associate Medical Officer of Health

DB/lm
Attach. (1)

City of Toronto
DEPARTMENT OF PUBLIC HEALTH

Request for Blood Sample Test

Name: _____
SURNAME FIRST NAME

Address: _____
POSTAL CODE

Telephone: _____ Sex (M or F): _____ Age: _____

I request that a physician or nurse obtain sufficient blood from a finger-prick of the above named for analysis for lead.

Date: _____ Signature: _____
PARENT OR GUARDIAN

Δῆμος Τορόντο
ΥΠΗΡΕΣΙΑ ΔΗΜΟΣΙΑΣ ΥΓΕΙΑΣ

Αἴτηση γιά Ἐξέταση Αἵματος

Ὀνοματεπώνυμο _____
ΕΠΩΝΥΜΟ ΟΝΟΜΑ

Διεύθυνση _____
ΤΑΧ. ΤΟΜΕΑΣ

Ἀριθμός
Τηλεφώνου _____ φύλο (Α ἤ Θ)_____ Ἡλικία_____

Αἰτοῦμαι τή λήψη τῆς ἀπαιτούμενης ποσότητας αἵματος μέ κέντρισμα τοῦ δαχτύλου τοῦ ἀνωτέρω προσώπου ἀπό γιατρό ἤ νοσοκόμα μέ σκοπό τήν ἀνάλυση γιά μόλυβδο.

Ἡμερομηνία_____ Ὑπογραφή _____
ΓΟΝΕΑΣ/ΚΗΔΕΜΟΝΑΣ

多倫多市
公共衛生部門

申請驗血

姓名 _____
姓

地址 _____
郵政號碼

電話 _____ 性別 □男 □女 年歲____

我請求醫生或護士替上述人士在手指抽血以檢驗鉛的成份。

日期 _____ 簽名 _____
父母或監護人

37-456 (B)

APPENDIX 9
DEPARTMENT OF PUBLIC HEALTH

CITY OF TORONTO

EPIDEMIOLOGICAL DATA – LEAD QUESTIONNAIRE PART 1

1. IDENTIFICATION NO.

2. SURNAME

3. GIVEN NAME

4. APT. NO.

5. STREET NO.

6. MOD

7. STREET CODE

8. STREET NAME

9. SEX ☐ MALE ☐ FEMALE

10. BIRTHDATE D M Y

11. YR. OF IMMIG.

12. BIRTHPLACE

13. CODE

14. PRIMARY OCCUPATION TITLE

15. CODE

16. SCHOOL

17. GRADE

18. SECONDARY OCCUPATION TITLE

19. CODE

20. TELEPHONE No.

21. DATE OF HOME VISIT D M Y

22. PREVIOUS OCCUPATIONAL LEAD EXPOSURE

☐ Y IF YES EXPLAIN ON REVERSE ☐ N ☐ UNCERTAIN

NAME OF INTERVIEWER

23. LENGTH OF RESIDENCE AT PRESENT ADDRESS YRS MTHS

24. LENGTH OF RESIDENCE IN THIS TEST AREA YRS MTHS

25. LENGTH OF RESIDENCE IN OTHER TEST AREAS (LAST 5 YEARS) YRS MTHS

26. ADDRESSES FOR PAST 5 YRS OTHER THAN ABOVE

27. DAILY HRS SPENT AT RESIDENCE ☐☐ HRS

28. DAILY HOURS SPENT WORKING OR AT SCHOOL IN TEST AREA ☐☐ HRS

29. TOTAL LONG ABSENCES LAST 5 YEARS YRS MTHS

30. IS THERE A LEAD WORKER IN HOUSE ☐ Y ☐ N

31. IF YES NAME OF COMPANY

32. OCCUPATION TITLE

33. CODE

34. IS HE/SHE TESTED AT WORK REGULARLY ☐ Y ☐ N

35. IF Y, BLOOD OR URINE ☐ B ☐ U

36. DOES HE/SHE USE PROTECTIVE CLOTHING AT WORK ☐ Y ☐ N

37. ARE WORK CLOTHES CHANGED AT WORK ☐ Y ☐ N

38. ARE WORK CLOTHES WASHED WITH FAMILY CLOTHING ☐ Y ☐ N

39. ARE SHOWERS USED AT WORK ☐ Y ☐ N

40. IS AN ELECTRIC KETTLE USED BY THIS PERSON ☐ Y ☐ N

IF YES

41. HOW MANY CUPS A DAY DOES THIS PERSON DRINK ☐☐

42. HOW MANY CUPS A DAY ARE USED IN COOKING ☐☐

43. IS THERE A HISTORY OF ANEMIA ☐ Y ☐ N

44. IS GASOLINE SNIFFING ADMITTED ☐ Y ☐ N

45. CHILD KNOWN TO INGEST PAINT ☐ Y ☐ N

46. CHILD KNOWN TO INGEST SOIL ☐ Y ☐ N

47. OBSERVED SIGNS OF PAINT PICA ☐ Y ☐ N

48. HOW LONG HAS PERSON BEEN SMOKING ☐☐ YRS

USUAL TYPE OF SMOKING

49. CIGARETTE ☐ 1

50. NO. OF PACKS A DAY ●

51. OTHER ☐ 2

52. STATE TYPE AND QUANTITY

53. HAS PERSON STOPPED SMOKING IN PAST 5 YEARS ☐ Y ☐ N

54. IF Y, HOW LONG AGO YRS MTHS

55. DO OTHERS IN THE HOUSE SMOKE ☐ Y ☐ N

APPENDIX 9
PART 2

Name of Patient: _____

ASK:

1. Is sandblasting an occupation, hobby or project, or removing paint with a blow torch?

_____

2. Artists/painters. Do they use leaded paints or sprays?

_____

3. Re kettle: Brand _____ Model# _____ Age _____

4. Has soil been tested for lead in play area or vegetable garden? Sand box dirt?

_____

5. Is pottery used for working or eating?

_____

6. Are coloured papers burned in the fireplace or stove?

_____

7. What insecticides have been used recently? Please check label for lead.

_____

8. Are there lead pipes (plumbing) in the house? Yes _____ No _____

OBSERVE:

1. Is there a gas station or busy road near house?

_____

2. Is there bare soil or vacant lot used for play nearby - especially within 3 ft. of house?

_____

3. Is there old flaking paint? Ask re lead content or age?

_____

4. Is there excessive dust in home? on drive way? on sidewalks?

PART II

A STUDY OF AREA-SPECIFIC BLOOD LEAD LEVELS IN TORONTO GRADE ONE CHILDREN

Submitted by: Susan Stiasny, M.B.A.

to: Eastern Health Area
Department of Public Health
City of Toronto

March 1983

SUMMARY

In order to assess whether the South Riverdale community is subject to unusually high lead burdens, a study comparing blood lead levels of Grade 1 children from disparate areas of the city was conducted. It was found that the mean blood lead level of children living in South Riverdale was not statistically different from that of either a socio-demographically similar group in the city's west end or that of a dissimilar group at the city's north end. Their mean blood lead level was somewhat higher than that of children living in Eastern Health Area further than 1500 metres from Canada Metal. No cases of elevated blood lead were observed.

INTRODUCTION

Since 1969, there has been concern that residents in the neighbourhood surrounding Canada Metal Company Ltd. have been subject to unacceptably high lead burdens. Screenings for blood lead have been conducted annually since 1973, when a mass screening of over two thousand residents found 15% to have readings of 30 ug/dl or greater. This finding was considered alarming in that agencies such as the U.S. Centers for Disease Control define elevated blood lead in children as 30 or greater ug/dl (1), 30-69 ug/dl are considered "elevated", and "lead poisoning" occurs when readings are over 70 ug/dl.

Soil clean up operations in the neighbourhood and stringent emission controls at Canada Metal were instituted subsequent to the 1973 screening and in response to concerted community pressure. Over time, the proportion of readings over 30 ug/dl in the local residents tested fell to less than 1%. Furthermore, ambient air lead levels surrounding the plant fell from an annual geometric mean of 2.5 ug/m^3 in 1974 to .8 ug/m^3 in 1981, and in recent years have been generally within the guidelines set and regulated by the Ministry of the Environment.

Within the Toronto Department of Public Health, it was questioned whether the prevalence of elevated blood lead in the South Riverdale area is sufficiently high to justify continued mass screening. Berwick and Komaroff (2) estimated that lead screening becomes increasingly cost-ineffective in terms of preventing learning disability and mental retardation as the prevalence of lead poisoning in young children falls below 6.7%. They suggest that at lower levels, resources could be more appropriately directed toward other community health prevention and promotion strategies, e.g. education programs, soil replacement, plumbing replacement, etc. It can be hypothesized that screening becomes a relatively expensive means of conducting community education about lead issues as community participation rates in lead screening decreases.

A summary evaluation of the 1977-79 lead screening program around the three lead plants in Toronto (3) concluded that "there is no evidence of a lead problem surrounding the plants as reflected by the levels of F.E.P. (free erythrocyte protoporphyrin, an alternate measure of body lead burden) in the members of the community tested." However, because the number of individuals tested was few, and given the self-selected nature of the groups tested, it has been difficult to assess whether continued screening has been worthwhile. While the screenings have served to monitor the blood lead levels of some members of high-risk groups in the area (ie - children and women of childbearing age), results from such screenings could not be taken to be representative of the community's exposure.

A mass screening such as that carried out in South Riverdale Lead Week, 1982 requires the deployment of extensive staff, community and monetary resources. It was, therefore, considered important to include a study component in the Lead Week program to assess whether screening for blood lead in Eastern Health Area (EHA) is an appropriate means of dealing with the lead issue.

The study compared the blood lead levels of children who live in five areas of the City of Toronto:

(1) The area within 500 metres of Canada Metal (EHA 500)

(2) The area within 500-1500 metres of Canada Metal (EHA 500-1500)

(3) The area within the Eastern Health Area outside of 1500 metres of Canada Metal (EHA 1500+).

(4) The area of Toronto outside of Eastern Health Area with socio-demographic characteristics similar to South Riverdale (SOCIO-SIM).

(5) The area of Toronto outside of Eastern Health Area with socio-demographic characteristics dissimilar to South Riverdale (SOCIO-DIFF).

METHOD

To select comparison areas, 1976 statistical profiles of minor planning districts in the City were examined. The geographic boundaries of South Riverdale were found to closely

approximate district 6-G, and it was therefore compared with 26 other districts in the city.

An index of similarity was devised for the variables given in the publication Metropolitan Toronto Planning Districts (4) such that regions were assigned values of 2, 1 or 0 based on degree of similarity with the South Riverdale district 6-G. Characteristics of the areas chosen are shown in Table 1 and the areas themselves are shown in Appendix I.

TABLE 1

CHARACTERISTICS OF AREAS FROM WHICH SCHOOLS WERE SAMPLED

	AREAS				
	EHA 500 EHA 500-1500	EHA 1500+	SOCIO-SIM		SOCIO-DIFF
	6-G	6-E	3-G	2-B	4-D
% pop'n change 71-76	-15.1	-13.1	-14.1	-13.6	-6.6
% Chinese/Japanese	9.4	5.9	.6	1.3	1.7
% Greek	3.2	13.2	3.8	1.8	.8
% Italian	2.0	8.1	33.7	2.1	.9
% Portuguese	2.5	.6	5.0	1.4	.1
% Spanish	.2	.4	1.7	.3	.3
% Non English/French	27.6	41.3	56.5	47.3	17.0
% Age 0-5	8.6	9.1	9.6	6.3	3.9
% Age 6-12	11.9	10.4	14.5	7.9	4.5
% Age 13-18	10.6	8.1	11.4	8.3	4.5
% Age 65+	9.9	11.1	8.4	14.0	14.7
% Youth 16-24 Grade 9	11.5	12.5	15.2	6.2	.9
% Unemployed Youth	13.3	11.2	12.2	12.2	9.6
% Unemployed Men	5.7	6.2	5.3	5.1	3.8
% Unemployed Women	5.9	5.6	5.9	6.1	3.9
% Single Parent Families	17.1	13.7	9.0	9.5	15.9

It was decided to sample blood lead in schools rather than by means of household surveys because time and cost limitations made the latter unfeasible, and furthermore, the Lead Week program would involve clinics in four schools in the South Riverdale area. Eleven additional schools were selected for inclusion in the study, with the criterion that District Nursing Supervisors opined that ease of access and socio-demographic characteristics were comparable to those sought from the minor planning district analysis.

It was decided to study Grade 1 children because it was anticipated that blood sampling would be easier in this group than a younger one. Re-analysis of data obtained during previous South Riverdale screenings in 1973, 1980 and 1981, found no statistically significant differences between these age groups. Similar findings were observed in the Neri et al 1974 study of children in two British Columbia communities (5).

School boards and principals in each of the specified areas were approached to solicit co-operation for the study. It would involve teachers distributing and collecting letters and accompanying consent forms to the children, the provision of class time for the blood sampling and class and home telephone lists to enable follow-up of non-responders. It was most often not possible to get either list because classes were not finalized until the end of September.

A letter co-signed by the Medical Officer of Health and the Mayor, and a consent form were distributed during the week of September 20th and collected by September 29th, (Appendices II and III).

Finger-prick blood sampling was carried out during the week of October 4th by EHA testing teams at the school which the children attended. At each clinic school, particular teams were responsible for drawing blood samples from Grade 1 children so that teams could be allocated in a systematic way across study and control schools. (See Table 2).

TABLE 2

ALLOCATION OF TESTING-TEAMS

SCHOOLS	DAYS 1	2	3	4
EHA 500	A	B	C	D
EHA 500-1500	E	F	A	B
EHA 1500+ SOCIO-SIM SOCIO-DIFF	C	D	E	F

A, B, C, D, E, F = Teams

Blood samples were handled with the same methodology as for the mass screening program, and analyzed by ESA Laboratories of Boston, using anodic stripping voltametry.

RESULTS

Response Rates

Over 800 parents of Grade 1 children at fifteen schools in the different areas were approached for permission to include their child in the study. Response and completion rates are shown in Table 3.

TABLE 3

RESPONSE AND TEST COMPLETION RATES BY AREA OF SCHOOL

Area of School	# of Schools	# of Letters	% Response	% Completion
EHA 500	4	192	79.6	70.8
EHA 500-1500	5	259	64.5	50.2
EHA 1500+	1	46	71.7	41.3
SOCIO-SIM	3	168	81.5	61.9
SOCIO-DIFF	2	146	83.6	70.5
TOTAL	15	811	74.2	60.6

Seventy-four percent of parents approached returned the consent form to the school. However, of these, twelve percent were refusals and a further two percent were absent on the day that school was tested. This yielded an overall test completion rate of 60.6%.

Characteristics of the Children Tested

Subsequent analyses focussed on area of child's domicile rather than area of school attended. Characteristics of the study groups are shown in Table 4.

TABLE 4

DEMOGRAPHIC CHARACTERISTICS OF CHILDREN IN STUDY BY AREA OF RESIDENCE

Area of Residence	Number	Sex		Age		Parental Occupation	
		Male	Female			White Collar & Profess.	Other
		%	%	%	%	%	%
EHA 500	36	56	44	14	86	18	82
EHA 500-1500	141	52	48	19	81	24	76
EHA 1500+	103	58	42	11	89	42	58
SOCIO-SIM	103	55	45	14	86	27	73
SOCIO-DIFF	103	60	40	25	75	95	5
TOTAL	486	56	44	17	83	43	57

It can be seen from Table 4 that comparison groups were reasonably well-matched in terms of age and sex distirubtions; in fact, analyses revealed no statistically significant differences between groups. There were, however, differences in parental occupation across groups. Parents in EHA 500 and EHA 500-1500 and those in SOCIO-SIM, were significantly less likely ($p \leq .05$) to be classified professional or white collar than parents of children in EHA 1500+ or those in SOCIO-DIFF.

Relationship of Blood Lead to Age, Sex and Parental Occupation

When the data were examined overall, no statistically significant relationships were observed between blood lead and either age of child or occupation of parent. There was however, a statistically significant relationship with sex ($p \leq .01$) such that males had a mean of 12.0 ± 4.0 ug/dl whereas females had a mean of 11.1 ± 3.9 ug/dl. Thus, in subsequent analyses the effect of sex was controlled for statistics.

Relationship of Blood Lead to Area of Residence

Cross tabulations of blood lead by area of residence are shown in Table 5.

TABLE 5

CROSS-TABULATION OF BLOOD LEAD BY AREA OF RESIDENCE

		µg/dl						
AREA		00-4.9	05-9.9	10-14.9	15-19.9	20-24.9	25-29.9	TOTAL
FHA 500	#	1	10	17	6	2	0	36
	%	2.8	27.8	47.2	16.7	5.6	0.0	
FHA 500-1500	#	2	41	60	29	7	2	141
	%	1.4	29.1	42.6	20.6	5.0	1.4	
FHA 1500+	#	6	41	42	14	0	0	103
	%	5.8	39.8	40.8	13.6	0.0	0.0	
SOCIO-SIM	#	2	24	50	23	4	0	103
	%	1.9	23.3	48.5	22.3	3.9	0.0	
SOCIO-DIFF	#	5	29	56	12	1	0	103
	%	4.9	28.2	54.4	11.7	1.0	0.0	
TOTAL	#	16	145	225	84	14	2	486
	%	3.3	29.8	46.3	17.3	2.9	0.4	100

It can be seen that there were no children with blood lead readings of 30 ug/dl or greater in the study. Two children had readings over 25 µg/dl and a further fourteen had between 20 and 24 µg/dl. Eleven of the sixteen who had readings over 20 µg/dl lived in the EHA 500 and EHA 500-1500, and as compared with all other areas grouped, this proportion 11/177 is significantly different ($p \leq .05$) from that obtained in the other areas (5/309).

Furthermore, it can be seen that blood lead levels were not normally distributed, ie. symetrically about the mean. Therefore, the data was also transformed using a log transform for subsequent analyses. However, as the pattern of results after transformation of data was not different from those obtained from the raw data, the latter are presented here for ease of presentation and comprehension.

Means and standards errors of estimates obtained from different areas are shown in Figure 1.

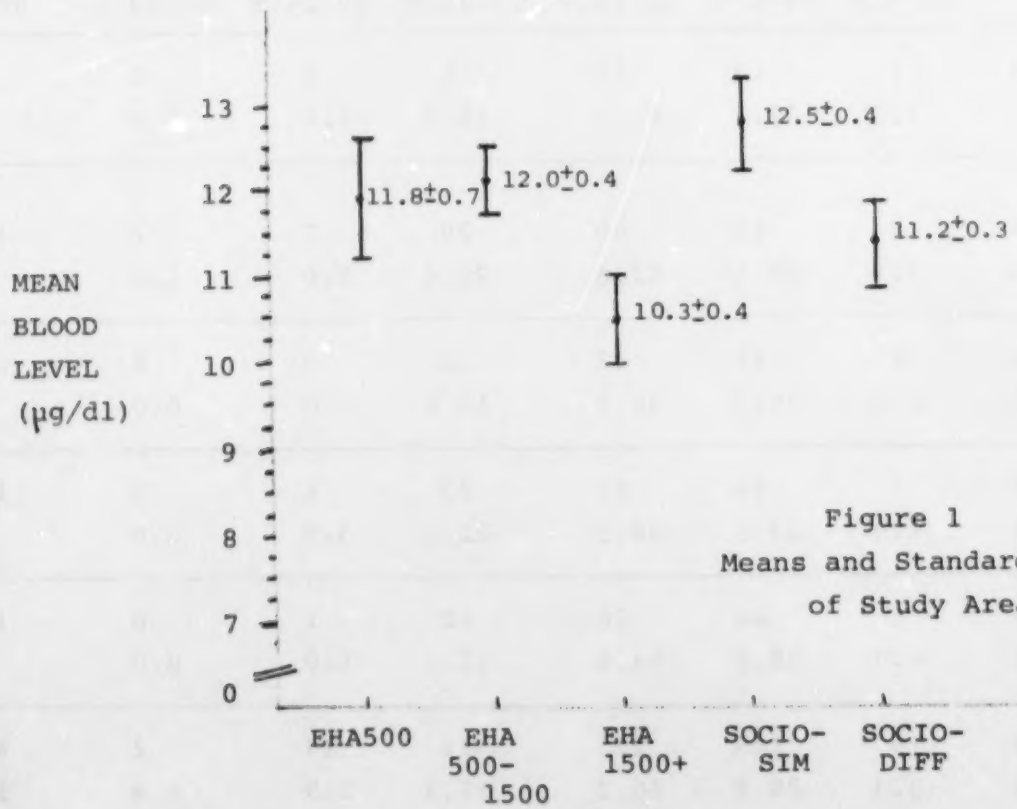

Figure 1
Means and Standard Errors of Study Areas

As a rough guide to interpretation, if the bars around any given mean overlap the range covered by that of another area, the means cannot be said to be significantly different. Thus, it can be observed that the only area to have a significantly different mean from EHA 500 and EHA 500-1500 is EHA 1500+, which had the lowest mean observed (10.3 ug/dl). The area with the highest observed mean (12.5 ug/dl) was SOCIO-SIM at the west end of the city, but this mean was not significantly different from that obtained in either EHA 500 or EHA 500-1500. SOCIO-DIFF, in the city's north end, had the second lowest mean (11.2 ug/dl), and while this mean was significantly lower than that of SOCIO-SIM ($p. \leq .02$), it was not different from any other area.

Finally, it should be noted that there was no significant difference in the means observed of the children living in EHA 500 compared to that of the children living in EHA 500-1500.

DISCUSSION

The study was conducted to assess whether Grade 1 children living in the South Riverdale area are subject to blood lead burdens greater than those of children living in other areas of Toronto. It was anticipated that results from the study would be of use in decision making about the form of future lead-related programs in Eastern Health Area.

Having sampled Grade 1 children, it is likely possible to generalize to children in higher grades, as it has generally been found that blood lead in children declines as a function of age (6, 7). Of the 177 children sampled from the South Riverdale area, none had elevated blood lead levels of 30 ug/dl or greater. Stopps and Pauker point out that "there is no identifiable threshold above which health is impaired and below which health is not impaired", (6)(Part II, p. 31) and surmise that selection of limits therefore necessarily involves other considerations such as cost and feasibility.

While blood lead levels of as low as 10 ug/dl have been noted to interfere with metabolic functions, evidence is only preliminary that levels below 30 ug/dl may have an impact on cognitive and behavioural functions. The Environmental Protection Agency's proposed air standard for lead (6),(Part II, p. 27) has suggested a mean of 15 ug/dl whole blood as the target no-effect level for the population 1-5 years old and this target translates to an upper limit of 30 ug/dl in a population of this age group.

The mean blood lead readings observed among children in South Riverdale was 12.0 ug/dl. This mean was statistically higher than that observed in the EHA outside of 1500 metres from Canada Metal (10.3 ug/dl), but not different from that observed when all comparison groups were taken together (11.3 ug/dl).

Statements of statistical significance are not necessarily statements of clinical relevance, and in this particular case, should not be taken as such. To assert that "there is a statistically significant difference between means" implies that whatever variable was measured distinguishes one population from another. It would be fallacious to therefore conclude that the different populations necessarily require different courses of action.

Prior to the execution of the study, the then EHA Associate Medical Officer of Health suggested that mean differences of less than 3 mg/dl would not have much clinical relevance with regards to courses of action to pursue. Given the relatively low means observed in the groups studied, the appropriate "clinical-trigger" is likely even higher.

The observed mean in the South Riverdale area was not statistically different from that of the socio-demographically similar comparison area drawn from the west-end of the city. Care was taken that children in that comparison area not reside in either the Junction Triangle or in the neighbourhood of the now departed Prestolite Lead Processing Plant. This finding, therefore, seems to indicate that children in South Riverdale bear a lead burden commensurate with living in an industrial area of the city.

The observed mean in the South Riverdale area was not statistically different from that of the socio-demographically dissimilar group drawn from the north-end of the city. Thus, a formidable socio-economic difference between the two areas did not serve to differentiate the two groups in terms of blood lead burden.

The observed mean of the children in the area outside of 1500 metres from the Canada Metal Plant was lower than any of the other groups, statistically so relative to the South Riverdale area and the area similar in socio-demographic features, and tending so for the socio-demographically different group. It was not known why this finding was obtained, but it can be speculated that either a response bias of unknown nature was operative, or perhaps, that the children sampled from that area were more likely to live on lower traffic residential streets than were those in the other groups. Unfortunately, test completion rate by area of residence could not be determined.

The lead levels of children living in the area within 500 metres of the Canada Metal Plant were not statistically different from those living 500-1500 metres distant. This would suggest that if mass screening is continued in South Riverdale, both areas should be considered equally at risk and therefore, equally eligible.

There were few children observed whose blood lead levels were over 20 ug/dl, but a significant proportion of them lived in the South Riverdale area and the area similar in socio-demographic features. It can be surmised that either this is a spurious finding or that there are lead "hot spots" within the city to which a small proportion of residents are exposed. Whether these "hot spots" are attributable to the residual effects of lead processing plants, vehicular traffic, or some other source of lead contamination remains a subject of conjecture.

And as a final thought:

Leaden Inspiration

Limiting exposure
is possible;

Exposure's elimination
is impossible.

REFERENCES

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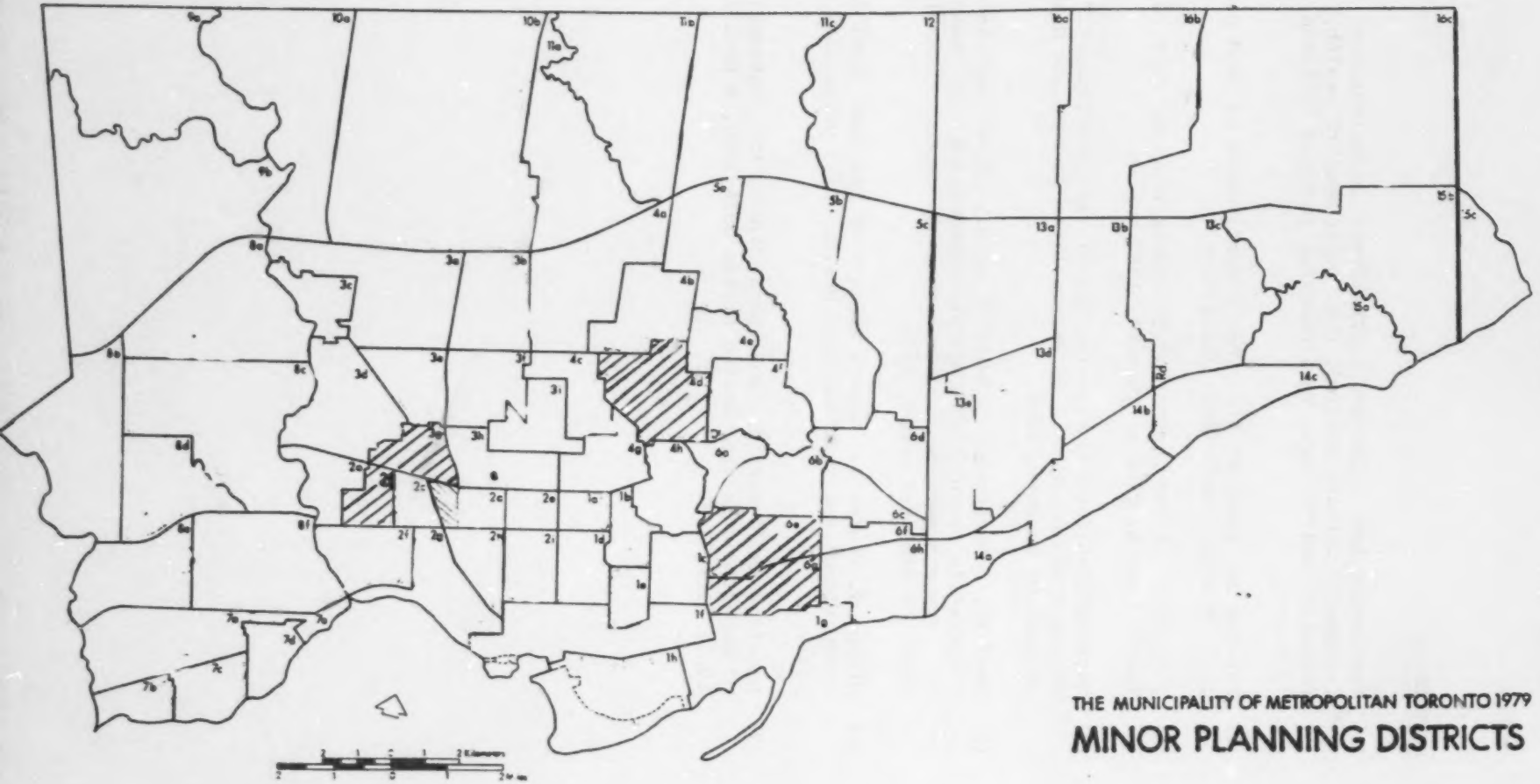
(7) Mahaffey KR, Annest JL, Roberts J, Murphy RS. National estimates of blood lead levels: United States 1976-1980. N Engl J Med. 1982; 307:573-9.

APPENDIX I



THE MUNICIPALITY OF METROPOLITAN TORONTO 1979

MINOR PLANNING DISTRICTS

AREAS SAMPLED

JUNCTION TRIANGLE

PRESTOLITE

APPENDIX II

The City of Toronto
Arthur C. Eggleton
Mayor

September 15, 1982

Dear Parent:

We are writing to enlist your help in measuring lead levels in children in Toronto. As you may be aware, lead pollution is a topic of some concern in cities around the world. Evidence has shown that people in cities may be exposed to somewhat elevated levels of lead in the environment. As a result, the amount of lead in the blood of some city dwellers, particularly children, may be higher than is considered medically acceptable.

The Department of Public Health is conducting a study during the week of October 4, 1982, to see if this is indeed a problem in Toronto, and if so, in which areas. They would like to take measurements from grade one children in several schools around the city.

Your child's school has been chosen by random selection for inclusion in the study. The study entails taking a sample of each child's blood by means of a simple finger-prick test. The test will be administered by fully qualified and experienced nurses who will go to your child's school. The results of the test, together with an explanation of what it means, will be mailed to you. You can be assured that the results will remain confidential, and that no personal information will be released by the Department without your permission.

We strongly urge you to assist the Health Department by consenting to have the finger-prick test administered. It will help us to protect the health of children in Toronto. Please complete the attached form today, and return it to your child's teacher as soon as possible.

If you have any further questions or concerns, feel free to call Ms. Susan Stiasny at 469-5158.

Thank you for your co-operation in helping to make Toronto a healthier city for our children.

Yours truly,

Dr. A. S. Macpherson
Medical Officer of Health

Mayor Art Eggleton

APPENDIX III

City of Toronto

DEPARTMENT OF PUBLIC HEALTH

Name of child: _____
Surname First Name

Address: _____ Postal Code _____

Telephone _____ Sex (M or F) ____ Age _____

Occupation of Head of Household: _____

I hereby consent____ refuse consent____ to the Public Health Department to administer a finger prick test for blood lead to my child. I understand that I will be given the results of the test and that they wi-l be used by the Public Health Department in its study of lead in Toronto.

_____
Signature

PLEASE RETURN THIS FORM TO YOUR CHILD'S TEACHER TODAY, WHETHER YOU HAVE GIVEN CONSENT OR NOT.

THANK YOU.

CONCLUSIONS AND RECOMMENDATIONS

SOUTH RIVERDALE LEAD WEEK, 1982

South Riverdale community awareness increased regarding sources and effects of environmental lead pollution as well as means to lower lead exposure. This was due to public education while promoting blood lead screening clinics and to distribution of the excellent "Get the Lead Out!" pamphlet to individuals screened.

RECOMMENDATION 1: That the Department provide "Get the Lead Out!" pamphlets to school and public libraries, community centres, health care providers, churches, etc. in the South Riverdale area. Additional means to distribute the pamphlet to new residents should be identified and implemented.

12% of the target age groups (children aged 0 - 9 and females of reproductive ages 15 - 44) in the target area within 1,500 metres of the Canada Metal Company Ltd. (CMC) were tested. In addition to these 1,287 individuals, 568 others in the target area but not age groups were screened. Such community response is a credit to the South Riverdale Environmental Health Committee. However, it was not a random sample of the population and therefore results of those tested cannot be extrapolated either to the target population or the total population in the target area.

RECOMMENDATION 2: That any future lead studies in the South Riverdale area should use a random sample technique. While individuals not randomly selected could participate in a study, their results would not be extrapolated to the total population.

Mean blood leads ($\pm$ standard deviation) in the target area included:

Children aged 0 - 9 years	12.6 ± 4.5 ug/dl
Females aged 15 - 44 years	10.1 ± 4.1 ug/dl

Screened children aged 0 - 5 had significantly higher mean blood lead (13.8 ug/dl) than those aged 6 - 9 (11.9 ug/dl). Males had significantly (p 0.0001) higher values (13.1 ± 5.1 ug/dl) than females (11.2 ± 4.4 ug/dl). Time of testing (October or November) did not significantly affect results.

.....?@

Screened persons living 500 - 1,000 metres from CMC, whether of target age or in general, had significantly higher (p 0.04) lead levels than those living 1,000 - 1,500 metres from CMC, and insignificantly higher levels (p 0.20) than those living 0 - 500 metres from CMC. This was primarily due to higher lead levels among screened residents in the southwest and northwest quadrants of the 500 - 1,000 metres ring.

4 or 0.3% of the screened target population had screened blood lead of 30 ug/dl or greater. Of these, none were confirmed by follow-up blood lead testing to have elevated blood lead levels ($\geq$ 30 ug/dl) or lead poisoning according to definitions of the U.S. Centers for Disease Control (CDC).

Home visits by Department staff to individuals with screened blood lead of 30 ug/dl or greater usually identified possible sources of lead exposure and reinforced pamphlet information/advice.

In spite of CDC definitions, there is some evidence of pregnancy problems in women with levels of 26 - 29 ug/dl, controversial evidence of chromosomal abnormalities at levels of 20 - 25 ug/dl, and multiple studies in progress regarding effects of low lead exposure on neurologic/psychologic function in children.

5.9% of the screened target population had levels of 20 - 29 ug/dl. This included 6.6% of children aged 0 - 9, and 2.9% of females aged 15 - 44. This was more frequently noted in the southwest and northwest quadrants of the 500 - 1,000 metres ring. However, these results cannot be extrapolated to the total target population living in any quadrant in any ring around CMC, as it could be chance variation.

AIR LEAD LEVELS

CMC air lead emissions have been within provincial standards since December, 1980 except for two brief explainable and, in the future, preventable excursions. There are no permanent Ministry of the Environment air lead monitors in the two quadrants noted above.

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RECOMMENDATION 3: That the Medical Officer of Health request the Ministry of the Environment to provide air monitoring data for the southwest and northwest quadrants of the 500 - 1,000 metres ring.

RECOMMENDATION 4: That the Medical Officer of Health request the Ministry of the Environment to continue air monitoring around CMC indefinitely.

RECOMMENDATION 5: That the Medical Officer of Health request the Ministry of the Environment to report on air lead emission from the Hearn Ontario Hydro generating plant, Metro Toronto incinerator, and the Metro main sewage treatment plant.

SOIL LEAD LEVELS

Mean soil lead at residences of individuals with a screened blood lead of 30 ug/dl or greater have been requested. Ministry of the Environment generally confined previous soil lead testing to the 0 - 500 metres ring. Several locations exceeded the limit of 600 p.p.m., considered excessive by the Ministry of the Environment, and the limit of 1,000 p.p.m., at which a significant positive epidemiologic correlation between soil lead and child blood lead begins. This is most relevant for children aged 0 - 5 who have higher average lead levels than older children and who are more likely to ingest dirt in the course of play, etc. In the mid 1970's, Wintario funded soil replacement at 37 target area sites with values exceeding 2,600 p.p.m.

RECOMMENDATION 6: That the Local Board of Health recognize the need for a comprehensive soil lead map for the area within 1,500 metres of CMC and instruct the Medical Officer of Health in co-operation with the Ministry of the Environment and University of Toronto to report on the feasibility and methods for constructing such a map.

RECOMMENDATION 7: That the Department designate areas with soil lead greater than 1,000 p.p.m. as high risk for children aged 0 - 5.

RECOMMENDATION 8: That the Department advise householders within known designated areas to have their children aged 0 - 5 tested annually for free erythrocyte protoporphyrin and for blood lead as appropriate.

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RECOMMENDATION 9: That the Department contact the parent/guardian of the 47 children aged 0 - 5 with a 1982 screened blood lead of 20 - 29 ug/dl offering to help identify possible sources of lead exposure and educate accordingly. The service will also be offered to those referred with levels of 20 ug/dl or greater by physicians in the future. The identification process would include residence paint and soil lead testing if relevant.

RECOMMENDATION 10: That the Medical Officer of Health request the Ministry of the Environment to sample soil at all public playsites within known designated areas if frequented by children aged 0 - 5 and not previously tested.

RECOMMENDATION 11: That the Medical Officer of Health request appropriate authorities to replace any soil at public playsites with lead concentration greater than 1,000 p.p.m. if frequented by children aged 0 - 5.

RECOMMENDATION 12: That the Medical Officer of Health request the Commissioner, City of Toronto Department of Public Works to intensify street washing and sidewalk cleaning in the area(s) designated as high risk for children aged 0 - 5 years.

CONTROLLED STUDY OF GRADE 1 CHILDREN

A study of Grade 1 children revealed mean blood leads to be significantly higher for males but not significantly different according to age or parental occupation. The only significant difference among mean blood leads for the 0 - 500 metres ring (11.8 ug/dl), 500 - 1,500 metres ring (12.1 ug/dl), socioeconomically similar area in west Toronto (12.5 ug/dl) and dissimilar area in north Toronto (11.2 ug/dl) was between the latter two areas. Too few children living in South Riverdale more than 1,500 metres from CMC responded to screening invitations in order to make valid conclusions about that area.

6.2% of children in 0 - 500 metres and 500 - 1,500 metres rings had screened blood lead of 20 ug/dl or greater as compared to 3.9% in the similar area (west Toronto) and 1% in the dissimilar area (north Toronto). No child in any area had an elevated screened blood lead level.

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As a means of detecting elevated blood lead, screening of Grade 1 children is not productive. The higher percentage of South Riverdale children with values of 20 ug/dl or greater could be chance variation and/or the residua of past exposure to airborne, soil, etc. lead prior to Grade 1.

RECOMMENDATION 13: That the Department discontinue mass lead screening as the results of the 1982 mass screening and the Grade 1 study have not identified cases of elevated blood lead or lead poisoning which require medical treatment.

STUDYING HEALTH EFFECTS OF LOW LEAD EXPOSURE

Multiple studies are in progress outside Canada to determine the possible neurological and psychological effects of low level lead exposure. A similar study in South Riverdale might corroborate findings elsewhere. However, Departmental involvement in such research would be at the expense of other City public health priorities.

RECOMMENDATION 14: That the Department review any neurologic/psychologic study protocol submitted by a research agency and if appropriate endorse but not fund. Any Department involvement would be on a complete cost recovery basis.

GAS LEAD

Lead in the human body is of no known value. The definition of elevated blood lead has gradually decreased over the past decades and may well continue to do so. Environmental sources should be eliminated by the most cost-effective means. One such means is by reducing leaded gas consumption. A 37% reduction in mean U.S. blood lead (aged 6 months to 74 years; adjusted for sex, race, and residence) from 1976 to 1980 paralleled the decrease in leaded gas consumption. This does not rule out other factors also contributing to falling blood lead levels. The federal Minister of the Environment is considering various proposals for revision of gas lead regulations.

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RECOMMENDATION 15: That the Local Board of Health write the Minister, Environment Canada, when proposed changes to the Federal Clean Air Act are in the public review stage, advocating for greatly reduced amounts of lead in gasoline sold in Canada.

PUBLICIZING RESULTS

RECOMMENDATION 16: That results of the 1982 mass lead screening and Grade 1 study as well as pursuant decisions by the Local Board of Health be communicated to South Riverdale residents in general by means of newspaper articles, Department participation in public meetings co-hosted by other interested agencies, letters to local health care providers, mall displays and other appropriate means.

ANNE JOHNSTON

Executive Alderman — Ward 13
Executive Offices
City Hall, Toronto M5H 2N2 - 367-7017

Executive Assistant: Judy Allan Secretary: Willa Wilbur

REFER FILE

MAR 11 9 55 AM 83

March 11, 1983

A.1

TO: MEMBERS OF LOCAL BOARD OF HEALTH

RE: REPORT ON LEAD WEEK

Tonight I attended the Eastern Health Area meeting, which considered the report. Few people have yet had an opportunity to read it with the care it deserves.

The Environmental Health Committee of the South Riverdale Community Health Centre has requested clarification on certain points in the recommendations. This will give an opportunity for that to happen. I believe that Ministry of Environment officials should be present.

Recommendation: That the Local Board of Health defer consideration of the report until its next meeting, so that interested persons, can address the Board of Health when the report is to be considered.

Yours sincerely

Anne Johnston

Anne Johnston
Executive Alderman
Chairman - Local Board of Health

Jesuit Centre

FOR SOCIAL FAITH AND JUSTICE

Board of Health A.2
agenda.
ATW.

On behalf of the Environmental Health Committee of South Riverdale Community Health Centre, I would like to make the following comments on the report "South Riverdale Community Blood Lead Screening 1982."

1. The large numbers of people who were tested provides ample testimony of the concern within the community regarding lead pollution. We agree with Recommendations 1 and 16 on continuing education within the community.

2. We are indeed pleased that the study has indicated that there has been a reduction in lead levels over the past 10 years.

3. Recognizing the progress that has been made, we still note with concern:
   - the higher blood lead levels in some sectors of the community, in particular in the areas to the west and northwest of the Canada Metal Plant;
   - And, that, in relation to the Canada Metal Plant, while there was no indication of significantly higher levels of lead on average, there was indication that the number of people tested with levels greater than 20 ug/dl was higher,

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the closer they live to the plant.

4. Recent studies, some cited on page 63 of the report, indicate the potential seriousness of blood lead levels greater than 20 ug/dl. As the report states, "...there is some evidence of pregnancy problems in women with levels of 26-29 ug/dl, controversial evidence of chromosomal abnormalities at levels of 20-25 ug/dl, and multiple studies in progress regarding effects of low lead exposure on neurologic/psychologic function in children."

   It was the results of such studies which initiated our concern with and work on this issue. We agree with Recommendation 14 and believe that the Department of Health, on an ongoing basis, should monitor such studies, continuing to re-assess whether their results indicate a need for further studies in South Riverdale. We would also appreciate the Department's cooperation with the Environmental Health Committee of South Riverdale Community Health Centre in establishing a resource library on the health effects of lead.

5. In order to better access the sources of these higher lead levels, we endorse Recommendations 3-5 regarding air monitoring.

6. Similarly, to assess the historic build-up of lead in soil around the Canada Metal Plant, we wish to underline the importance of and the need for study and action regarding soil lead in Recommendations 6-12.

7. Some additional comments should be made regarding the Recommendations 2, 13 and 8.

Recommendation 2 states that any future studies in the South Riverdale area should use a random sample technique, and Recommendation 13 that the Department discontinue mass lead screening. We wish to have these Recommendations clarified, and caution regarding the rationale stated in Recommendation 13, namely that "...the grade 1 study (has) not identified cases of elevated blood lead..." It should be clearly understood that "elevated blood lead" is a technical phrase to indicate levels over 30 ug/dl, and that it does not mean that there were not a larger number of people with higher blood lead levels in the area around Canada Metal. As the paragraph preceeding Recommendation 13 states, "6.2% of children in 0-500 metres and 500-1500 metres rings had screened blood lead of 20 ug/dl or greater as compared to 3.9% in the similar area (west Toronto) and 1% in the dissimilar area (north Toronto)." This means that six times as many children within a 1500 metre radius of Canada Metal had blood lead levels in access of 20 ug/dl as compared to children in north Toronto. Within 500 metres of the plant, 12 of the 86 children (14%) had blood lead levels greater than 20 ug/dl. On some particular streets in that neighbourhood, the percentages of children with blood lead levels over 20 ug/dl were higher than this average. If the Recommendations are to be publicized without the accompanying text, some appropriate note should be made to explain the technical meaning of "elevated blood lead."

Recommendation 8 states "that the Department will advise house-holders within known designated areas to have their children

0-5 tested annually for F.E.P. and blood lead as appropriate." We are not in favour of the use of F.E.P. tests to pre-screen for the appropriateness of blood lead tests. In the ranges of blood lead with which we are concerned, previous tests have shown a negative correlation between F.E.P. and blood lead.

We assume that Recommendation 8 authorizes the Department to play an active role in providing annual testing for children in the designated areas, and we would recommend that similar attention be given to children in the 0-5 age group who live on streets where the numbers of children tested with levels greater than 20 ug/dl was above average for the area. Recognizing that such testing would be for this very specific group of children in this particular area, we recommend a local testing clinic with adequate publicity and advertising.

8. In agreement with Recommendation 15, we encourage the Board of Health to take an active role in support of recommendations made by the Federal Ministry of the Environment to reduce the amounts of lead in gasoline sold in Canada. Given the extensive experience of both the Board and the Department regarding lead, which places them among the most knowledgeable in Canada on this question, we hope that members of the Board and officials of the Department will be encouraged to speak publicly on this matter.

I wish, on behalf of the Environmental Health Committee of South Riverdale Community Health Centre, to commend the Department of Health for this excellent report and for all the work that went into it. I would like to publicly express our appreciation of

the commitment given this work by Dr. Ed Ellis. In the four short months that he has worked in this community, his spirit of cooperation, his evident sense of concern and his willingness to act have won our confidence and respect. We look forward to continued cooperation.

LBOH Agenda. April 12/83

13

Community Advisory Board
Eastern Health Area
Department of Public Health
815 Danforth Avenue
Toronto, Ontario M4J 1L2
March 28th, 1983

Alderman Anne Johnston
Chairperson
Local Board of Health
Executive Office
City Hall
Toronto, Ontario M5H 2N2

Dear Anne:

As you know the results of October '82 South Riverdale Community Lead Week were released at a public meeting on March 10th. A summary sheet of the report is included with this letter as well as a copy of the minutes of the meeting.

At their March 21st meeting, Community Advisory Board members requested that their dissatisfaction with the poor attendance of Local Board of Health members at this event be recorded. A special effort was made to invite all members and their lack of interest was most disappointing.

Sincerely,

P. Thompson

for Sheila Cram
Chairperson
Community Advisory Board

/pt
Att.
cc: LBOH Members
Wards 7, 8 & 9
Aldermen

P.S. to Anne Johnston - Could you please include the minutes of the Lead Week Results Meeting on the April 12th LBOH agenda. Thanks.

MINUTES OF COMMUNITY MEETING RE
RELEASE OF OCTOBER '82 LEAD WEEK RESULTS
MARCH 10, 1983, 7:30 P.M.
ST. JOSEPH'S PRIMARY SCHOOL, 50 CURZON ST., TORONTO

A community meeting sponsored jointly by the Community Advisory Board (Eastern Health Area) and the Environmental Committee of South Riverdale Community Health Centre was held to publicly release the results of Lead Week Oct. '82.

With the use of overheads, report presentations were made by two Eastern Health Area staff members - Dr. Joan Erb, Area Physician and Ted Whiteside, Environmental Health and Inspection Services Manager.

Dr. Ed Ellis, Preventive Clinical Services Manager and Associate Medical Officer of Health in the Eastern Health Area, dealt with the recommendations going to the Local Board of Health.

Paul Summers, President of Canada Metal, gave a speech in response to the report and with an overview of the past ten years.

From the Ministry of the Environment, Barney Singh spoke briefly followed by Rob Rennie, an expert in soil contamination.

Anne Johnston gave a short response voicing her delight in the vastly improved relationship among all parties concerned.

Jim Webb, Chairman of the Environmental Committee, responded to the report and its recommendations.

Martha McCloin moved that the audience support and endorse the recommendations outlined by Dr. Ellis, with particular emphasis on the need for testing in areas (1) where soil levels are greater than 1000 parts per million and (2) where the number of children tested with levels greater than 20 ug/dl was above average for the area. Seconded by Barbara Linds. Carried.

The meeting was adjourned at 10:00 p.m.

Pat Thompson
Secretary - Community
Advisory Board

SUMMARY OF THE RESULTS

of

SOUTH RIVERDALE COMMUNITY LEAD WEEK

OCTOBER 4 - 8, 1982

MASS SCREENING

A total of 2,260 people had finger prick tests for blood lead. 2,159 attended the clinics during Lead Week October 4 - 8, 1982 and 101 attended pick-up clinics in November. The Environmental Health Committee of South Riverdale Community Health Centre are to be commended for their excellent promotional activities which resulted in this fine response. Community awareness about the sources and effects of lead was increased as a result of Lead Week and the pamphlet "Get the Lead Out!".

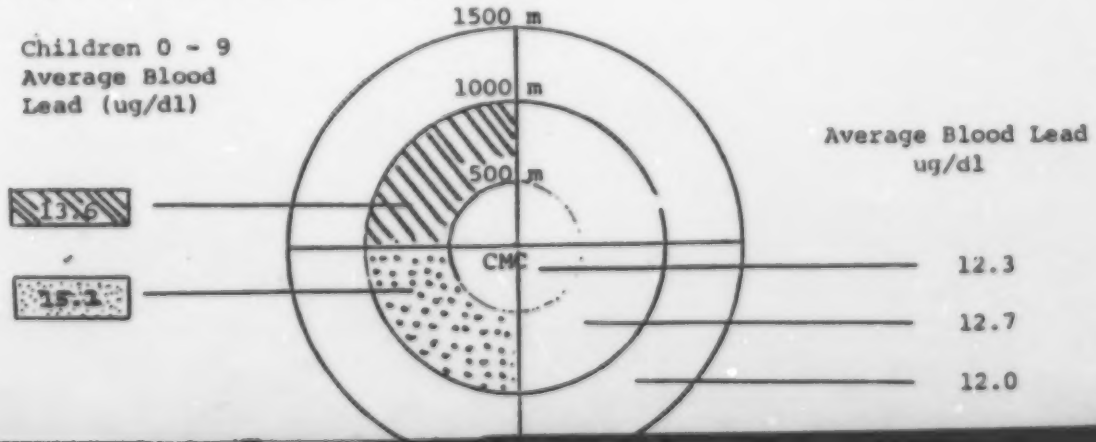
Our target group for screening was children 0 - 9 years and women of child-bearing age (15 - 44 years) living within 1,500 metres of Canada Metal plant (CMC). 12% of these (1,287 individuals) were tested.

Because the mass screening was voluntary and not a scientifically selected sample, the findings cannot be assumed to apply to the community as a whole.

The average blood lead was 12.1 ug/dl compared to 14.6 ug/dl when 74 people were tested in 1977.

Males had higher blood lead (average 13.1 ug/dl) than females (average 11.2 ug/dl). Younger children 0 - 5 years had higher blood lead (average 13.8 ug/dl) than children 6 - 9 years (11.9 ug/dl).

People living 500 - 1,000 metres from CMC had significantly higher blood lead (12.7 ug/dl) than those living 1,000 - 1,500 metres from CMC (12.0 ug/dl), and a little higher than those living within 500 metres of CMC (12.3 ug/dl). Average blood leads in children 0 - 9 years were higher in the south west and north west part of area 500 - 1,000 (15.1 and 13.6 respectively). Areas 0 - 500 and 500 - 1,000 had more blood lead levels of 20 ug/dl and over than areas 1,000 - 1,500 and 1,500 + (7.7%, 6.8%, 4.9% and 3.5% respectively).



No cases of lead poisoning (i.e. 70 ug/dl) were found. Of 10 people (0.4% of all tested), with screened blood lead levels of 30 ug/dl or over, only 1, (a middle aged person who has a hobby exposure to lead and smokes) was confirmed on further testing done at the Hospital for Sick Children.

SOIL SAMPLING

Soil sampling by Ministry of the Environment of all school sites showed levels acceptable to the Ministry (i.e. less than 600 parts per million). They have been requested to sample soil at homes of persons with blood lead 30 ug/dl or over in case it is a factor.

AIR MONITORING

Air monitoring at CMC has shown that monthly averages have been within provincial standards (i.e. less than 2 ug/cubic metre). In January and August 1982, there were two days when daily criteria were exceeded (i.e. 5 ug/cubic metre).

GRADE 1 CONTROLLED STUDY

The Grade 1 controlled study tested children in Grade 1 in fifteen schools: four in 0 - 500 metres range, five in 500 - 1,000 metres range, one in 1,500 + range, and three in West Toronto in a socially similar area and two in North Toronto in a socially different area. The average blood lead was 12.0 ug/dl for boys and 11.1 ug/dl for girls. Children living in EHA 1,500 + had lower values than elsewhere (10.3 ug/dl) and West Toronto had the highest (12.5 ug/dl). South Riverdale's average was 12.0 ug/dl. In all, sixteen children had readings of 20 ug/dl and over, and 12 of these lived in South Riverdale. None had blood lead of 30 ug/dl or over (above 30 ug/dl is considered elevated by the U.S. Centers for Disease Control, 1978).

THE RECOMMENDATIONS

The Recommendations to the Local Board of Health deal with the following issues: continued community education; future lead research (particularly that related to the effects of low levels); requests for further air monitoring and more information about soil lead within 1,500 metres of CMC; follow-up of children 0 - 5 years with leads greater than or equal to 20 ug/dl; designation of areas with lead soils greater than 1,000 parts per million, and in these areas children 0 - 5 years to be tested annually; increased street washing; soil replacement in public play areas if soil lead is greater than 1,000 parts per million; reduced lead in gasoline, and keeping the community informed of these results.